Chemical Week

'56 EARNINGS ..... page 20

March 16, 1957

Price 35 cents





Behind the Niagara building boom: new power, plenty of water and the coming Seaway spur . . . . p. 33

Target—brake linings that don't fade under heat. Here's what you should aim for . . . . . p. 65

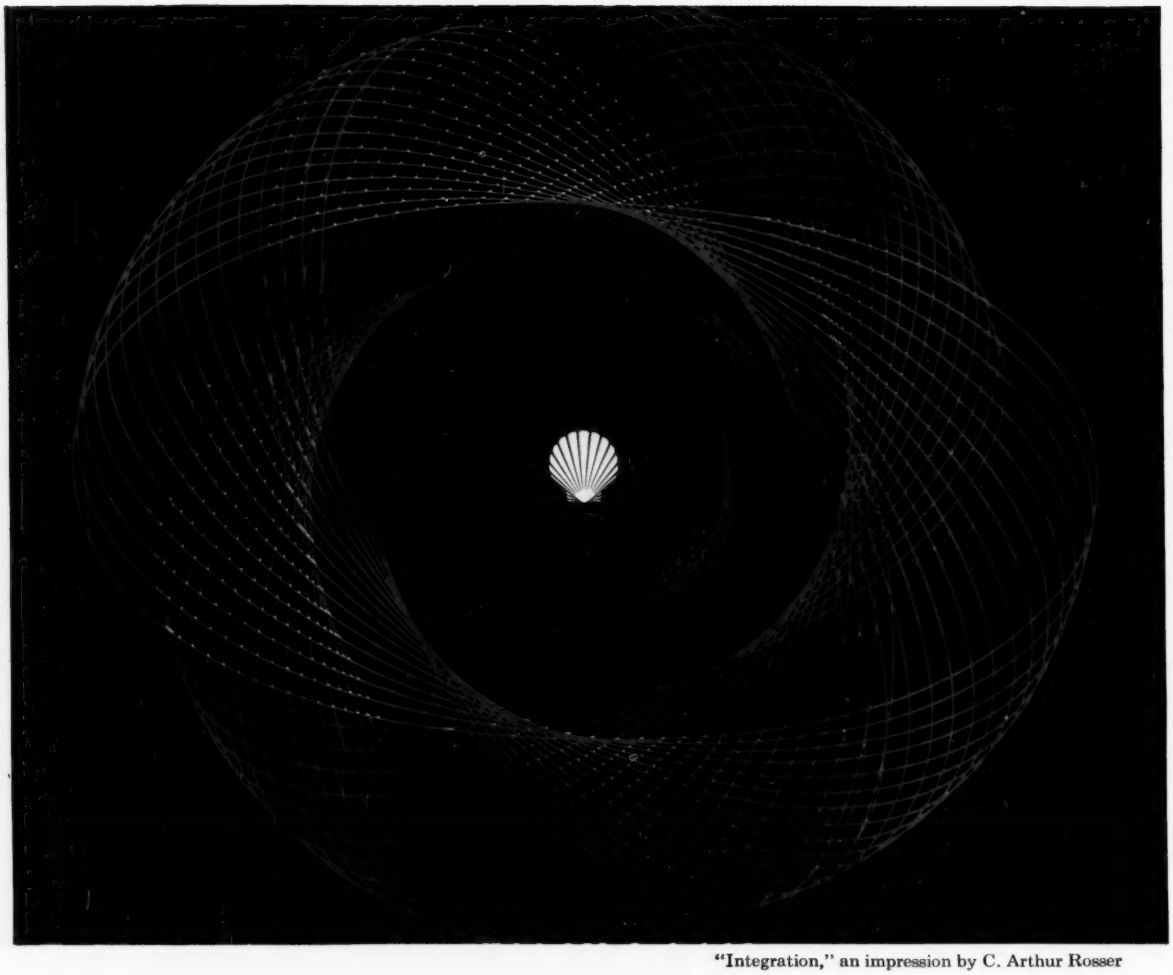
Technical manpower—plenty of disagreement over what's wrong, but accord on the remedy . p. 82

India's proposed synthetic rubber plant brings howls from Asian natural rubber producers . p. 100

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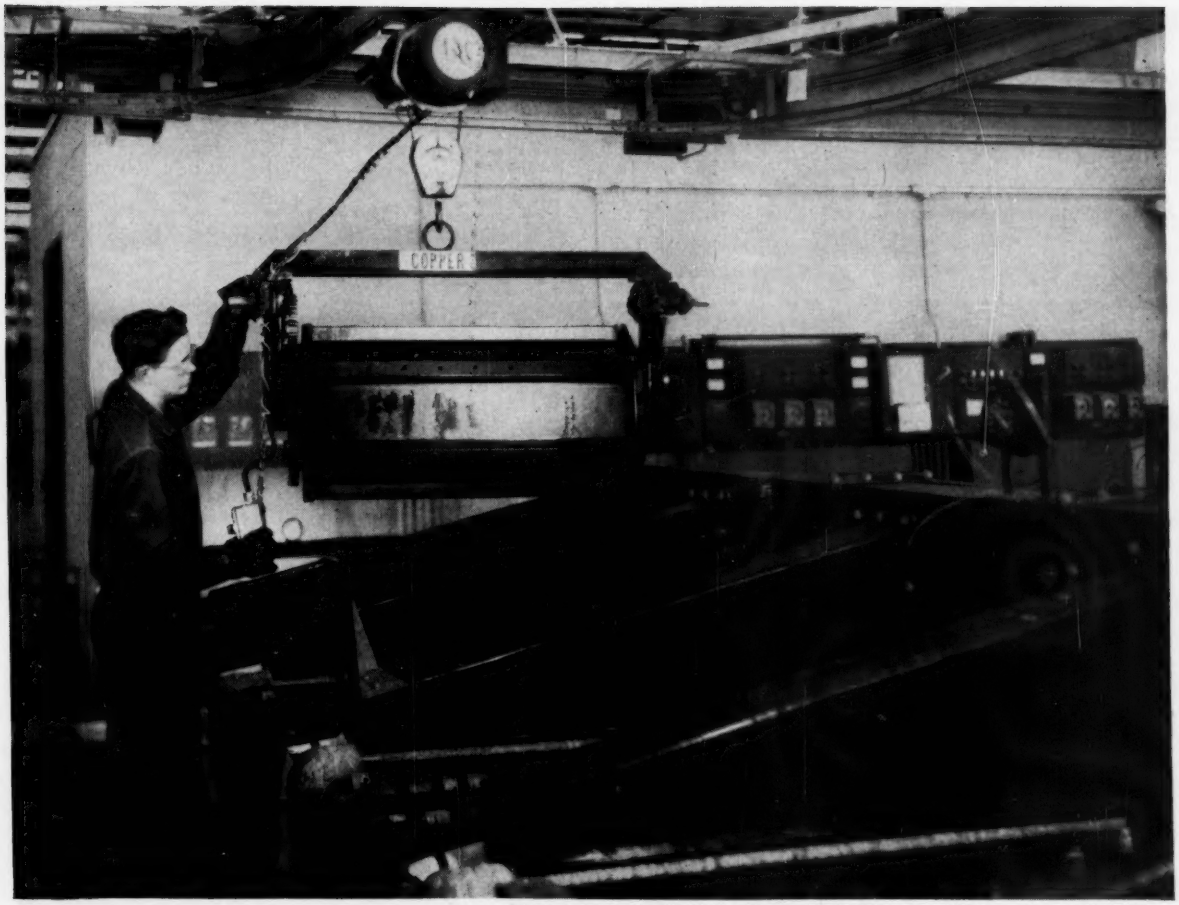


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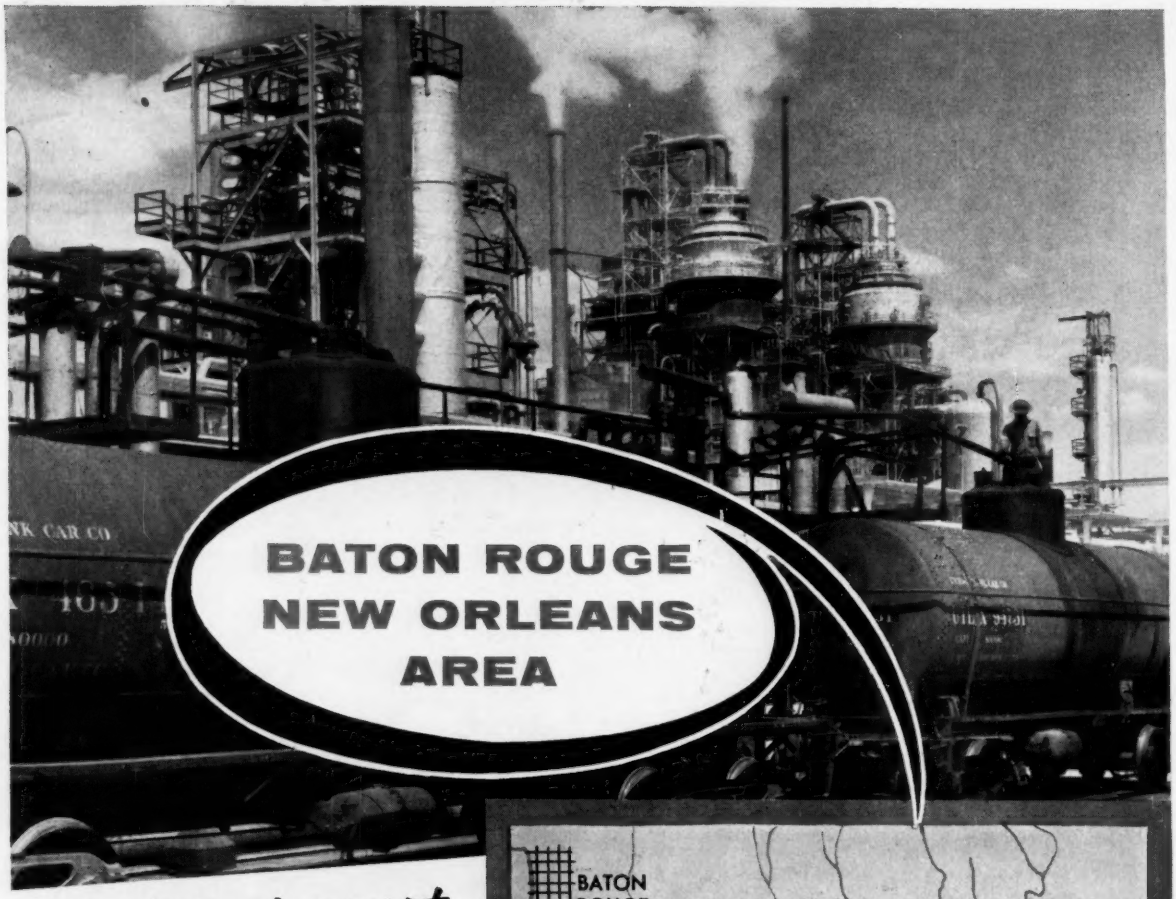
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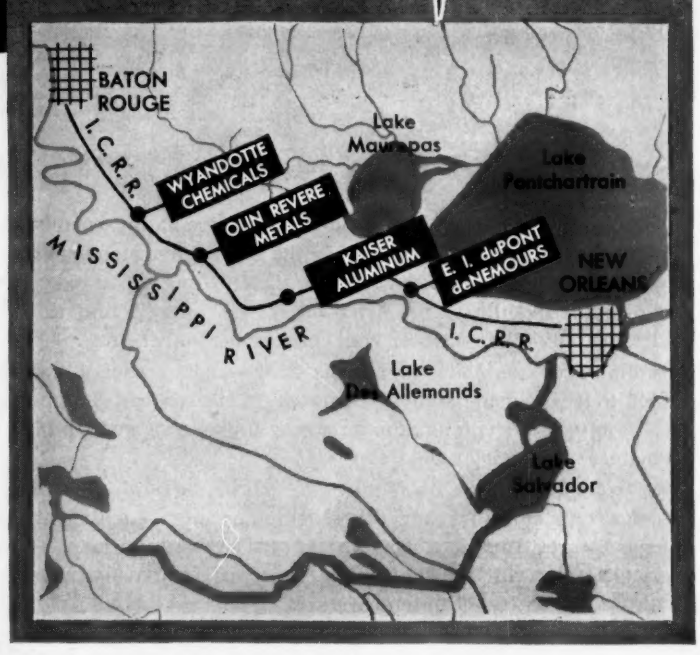
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Chemical Week

Vol. 80, No. 11

TOP OF THE WEEK

March 16, 1957

- **Despite dire predictions, '56 earnings** paint a not-unfavorable picture for many top chemical firms .....p. 20
- **Texas chemical firms will benefit** from a new $12-million Houston port project.....p. 38
- **Brushless wood finish, a combination lacquer and varnish,** is now ready for the market .....p. 72
- **Total sales of soaps and synthetic detergents** hit new highs in '56—and syndets grab a greater share of the market ..... p. 104
- **Sinclair's hush-hush X-Chemical gasoline additive** is tri-n-butyl phosphine .....p. 118

17 BUSINESS NEWSLETTER

20 '56 earnings would have looked different if the corporate income tax law being proposed by Sen. Fulbright had been in effect.

22 A divestiture order issued last week by FTC against Crown Zellerbach will be precedent-setting if upheld. It's the first clear-cut order of its type that FTC has issued against a manufacturing firm.

23 Union activity last week focused on the nation's two largest chemical companies. At Union Carbide's striking Essington plant, employees failed to respond to the company's invitation to return to work, while Du Pont is facing organizing moves at four of its plants.

23 Fast tax write-offs have been granted on liquid oxygen and liquid nitrogen rocket fuel plants.

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28 CHARTING BUSINESS

33 ADMINISTRATION

Fracas over hydro power doesn't deter chemical expansion at Niagara.

38 Sensing victory by 1960, British Labor party plots chemical takeover.

52 SALES

What's in store for the future chemical credit man?

55 Canada's Food and Drug Directorate urges switch to metric system.

65 Target for specialty makers: a truly heat-resistant brake lining. Here's what you'll have to aim for—and the potential reward.

72 SPECIALTIES

74 Biphenyl is getting a reputation on the Continent for causing cancer. Upshot: search is on for new fungicides.

82 PRODUCTION

Companies disagree on details of technical manpower and recruiting problems, but recommend similar long-range remedies.

88 Redesigned vertical kilns more than triple Electromet's lime production at Ashtabula.

97 TECHNOLOGY NEWSLETTER

100 MARKETS

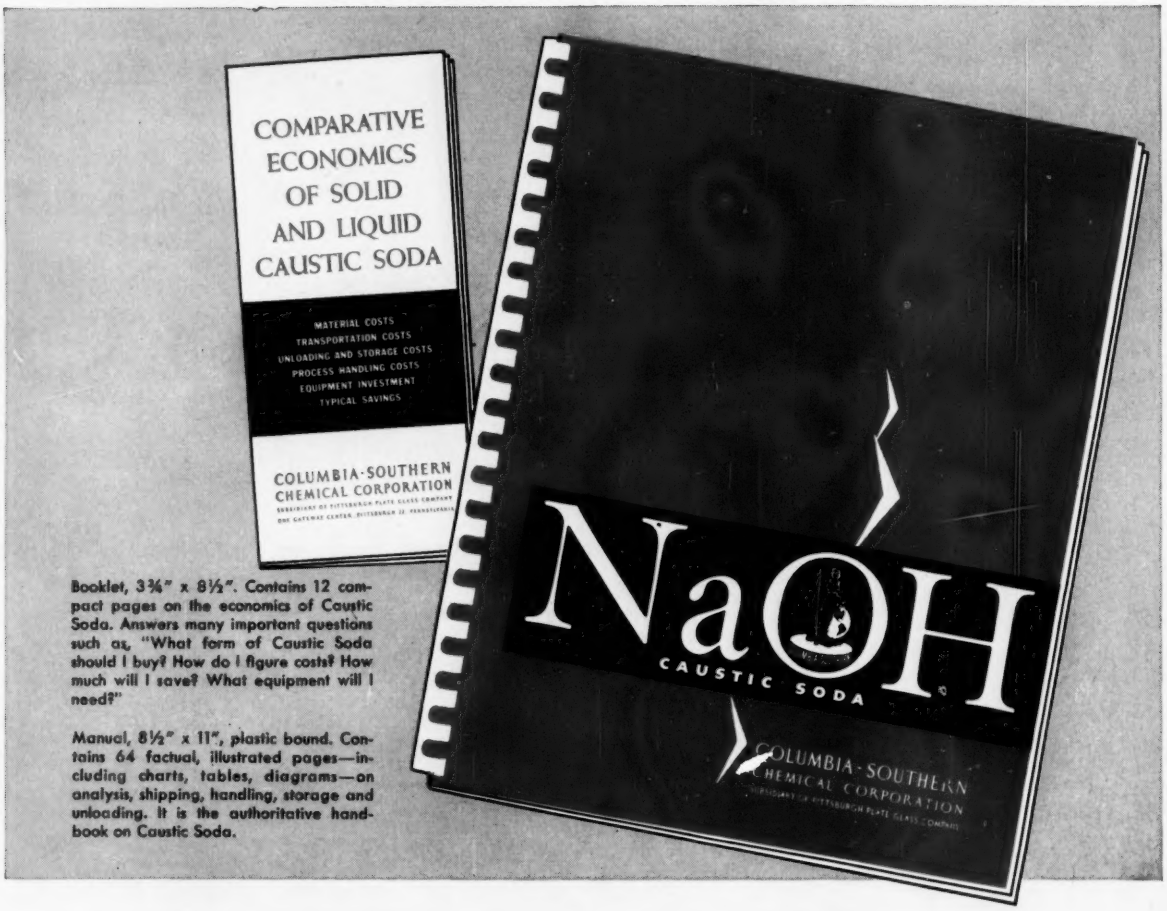
India will boost its rubber output by increasing plantation acreage and constructing a GR-S plant; but plantation operators aren't happy about the arrangement.

107 MARKET NEWSLETTER

112 RESEARCH

New acrylonitrile treatment vies with cyanoethylation for cotton rotproofing duties.

123 High Voltage Engineering Corp. unveils its new production, testing, and research facility for radiation machines.



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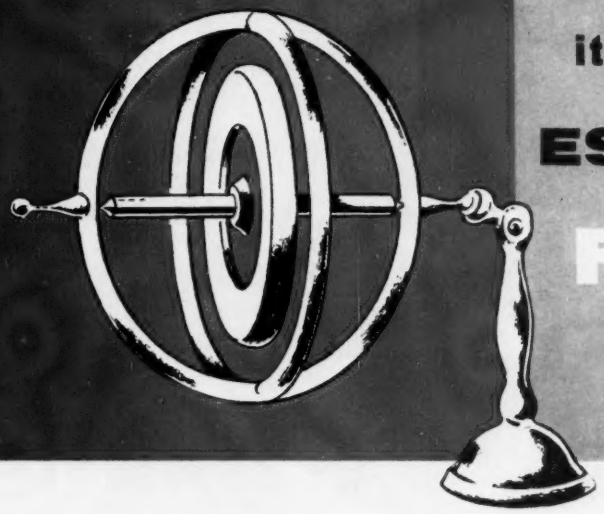
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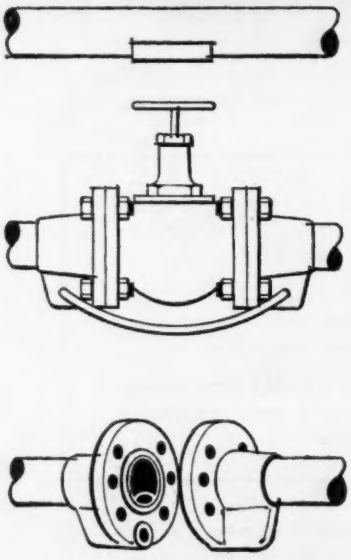
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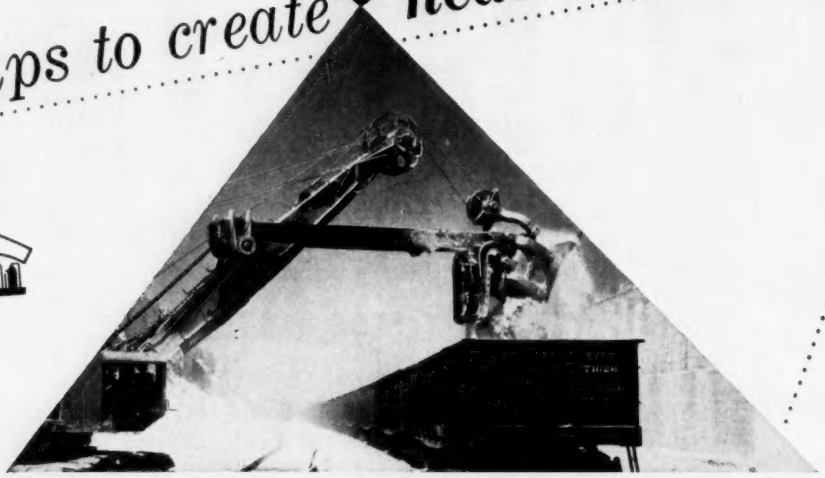
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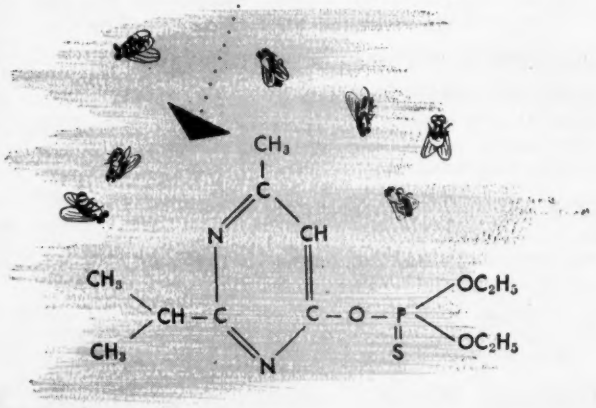
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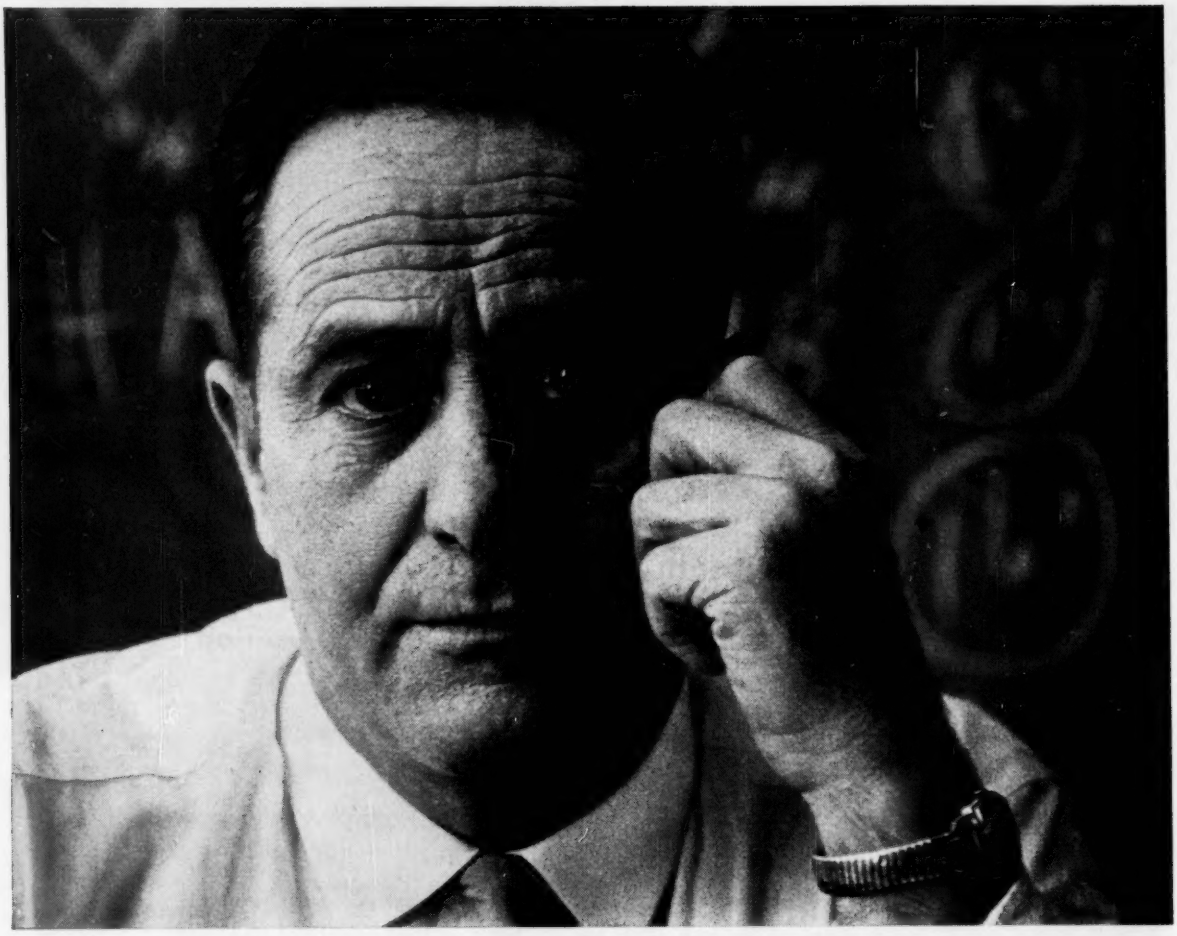
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Witches of old brewed heroic broths to encourage visions, prognostications, spells, and spasms. Even unrequited love yielded to these near-lethal potions. Add the tail of a cat, the ear of a rabbit, sixteen varieties of tree roots, and a few "trigger" ingredients, known only to the witches guild . . . and stand back!

Folklore ignores the witches' maintenance problems, but such overwhelming corrosives must have liquidated many a cauldron inventory. After all, the witches had no titanium.

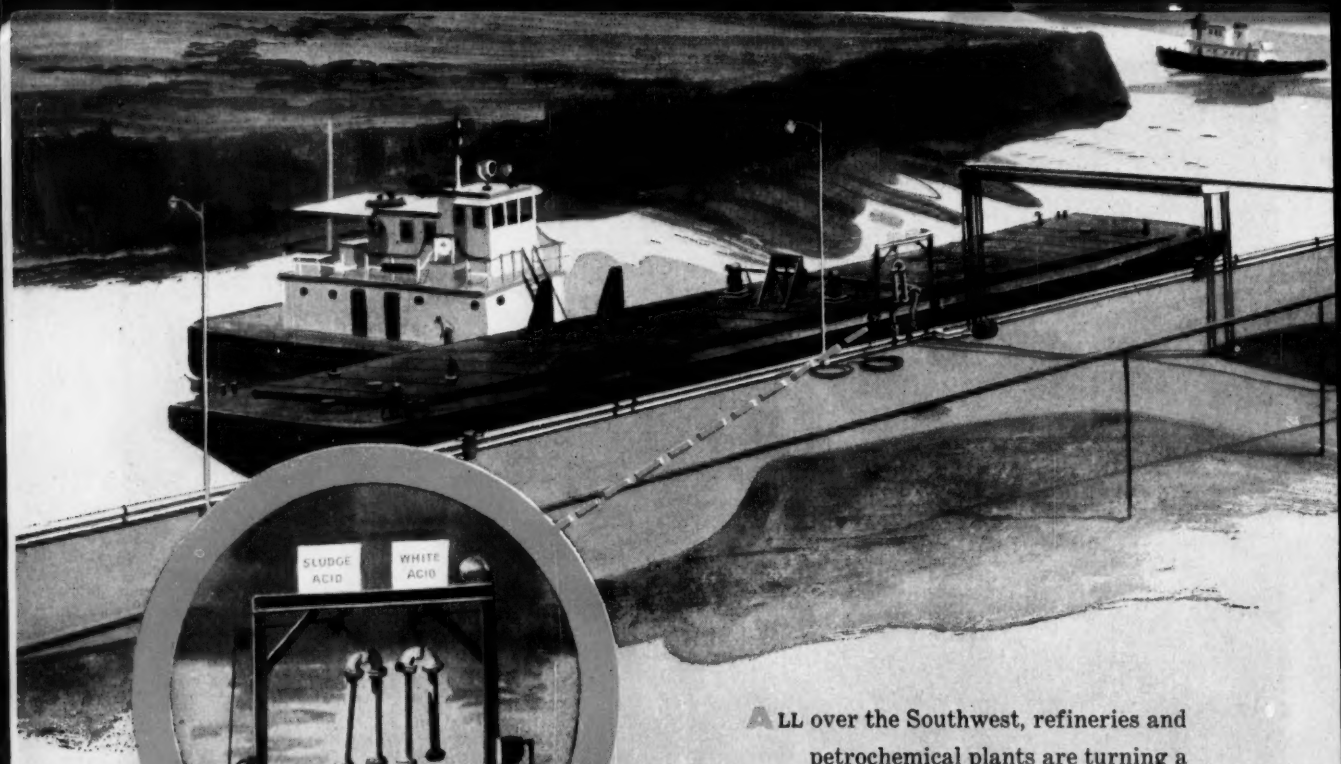
Titanium is available today, and it is the most promising metal for the chemical, textile and pulp industries . . . or any place where severe corrosion presents forbidding maintenance or design problems.

Titanium is inherently passive to such vicious corroding agents as ferric, cupric, stannic and mercuric chlorides, and the hypochlorites. There is even little or no pitting or localized attack — a source of difficulty with practically all other metals. Stagnant conditions, surface deposits, fouling marine organisms and moist salt crystals are not troublesome to titanium. Strongly oxidizing agents in high concentrations and at high temperatures are readily handled with titanium. Slight additions of oxidizing agents to sulfuric, hydrochloric or phosphoric acid inhibit attack.

Titanium tubing, sheet, strip, plate, extrusions, bar and billet are all available from T.M.C.A.— and prices are dropping to competitive levels. T.M.C.A. technical service is available upon request.

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ALL over the Southwest, refineries and petrochemical plants are turning a disposal problem into an asset by shipping their spent acids to one of Consolidated Chemical Industries' five sulphuric and recovery plants. Here even the heaviest sludges, with the lowest per cent of free acid, are turned into fresh, white 99% product on a contract basis. Shipments are handled by road, rail or water.

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Business
Newsletter

CHEMICAL WEEK
March 16, 1957

Will fast tax write-offs on additional glycerine capacity be forthcoming soon? The Office of Defense Mobilization hopes so. It has been able to do nothing on the matter since last November—when it asked the Justice Dept. to tell it whether the current producers of synthetic glycerine, Dow and Shell Chemical, could be given write-offs for further expansion without encouraging monopoly conditions. ODM has just given Justice an ultimatum: unless the antitrusters submit a ruling by March 15, ODM will consider Dow and Shell eligible for certificates—along with the other applicants, Olin Mathieson and Union Carbide.

Paradoxically, certificates to OM and Carbide could be issued quickly only if Justice rules Dow and Shell ineligible. The tonnage for which the four firms have applied exceeds substantially the amount of expansion on which the government will issue write-offs (*CW Market Newsletter, Sept. 29, '56*). Dow asked certification on a plant to cost $8,350,000; Olin, on one costing $10,675,000; Shell asked a $30-million write-off; Carbide, one for $9,384,000.

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May 13 is the new date for opening bids on the nearly 2 million shares of General Aniline & Film Corp. stock that the U.S. Dept. of Justice seeks to sell. The bid opening has been postponed from April 23 to allow prospective buyers of the stock more time to fill out the questionnaires that must be submitted with their bids.

•

New facilities—planned, started or about to go onstream—make news this week:

There'll be more than uranium hexafluoride produced at the plant Allied Chemical & Dye will build at Metropolis, Ill., as expected (*CW, March 9, p. 22*). The "multimillion"-dollar unit, first privately owned plant to make the hexafluoride, is also scheduled to become a production center for many other fluorine chemicals, with fluorine-type plastics due for special attention. Allied's General Chemical Division will operate the plant, which is due onstream in late '58, early '59.

Location's a little less definite for Montecatini. The firm has been site-seeking in Texas, among other areas, for its first U.S. industrial chemical plant, an dhas now acquired options on 200 acres along the Big Sandy River, near Neal, W.Va. But Montecatini says that it's still looking over other possible sites.

Alkyl boranes will likely be among the high-energy fuels turned out on a developmental basis at Callery Chemical's $38-million plant in Muskogee, Okla., ground for which was broken last week (*CW Technology Newsletter, July 7*). Callery, a subsidiary of Mine Safety Appliances,

will make its "HiCal" fuels for the Navy, hopes to have its plant in production by the end of '58.

Ready for operation in a few months will be Shell Chemical's low-pressure polyethylene pilot plant in Partington, England. The unit, designed to turn out 2 million lbs./year of the plastic—made by the Ziegler process—is the first of two low-pressure plants abuilding in England. British Hydrocarbon Chemical has the other, a 22-million-lbs./year plant, which will use the Phillips Process.

High-pressure polyethylene units are also under construction in England. Besides Imperial Chemical's already-operating plant, Monsanto and Union Carbide are building units that are due onstream by early '58. The new facilities can produce 43 million lbs./year.

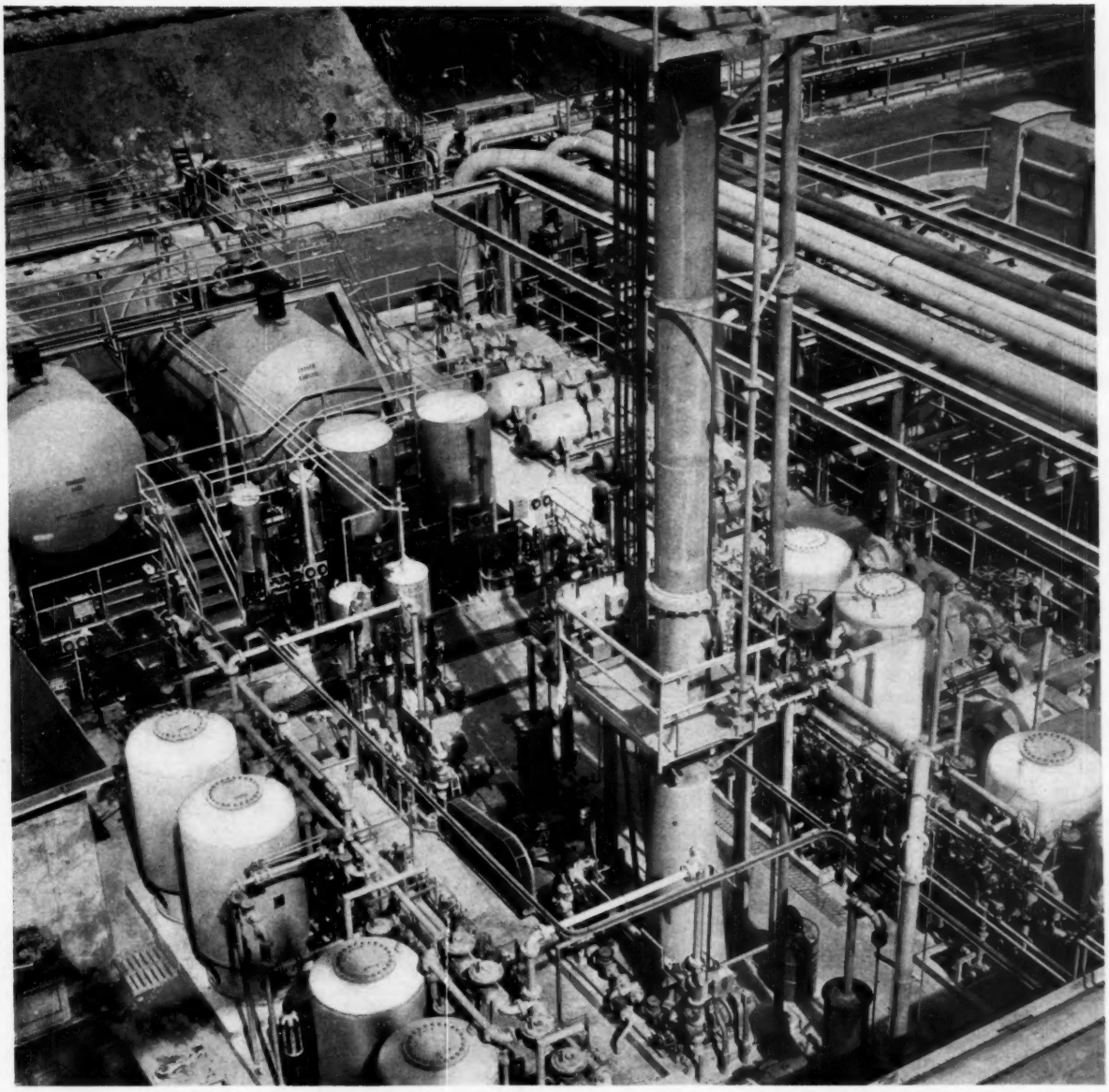
Chances of approval of the plan to sell the government-owned Louisville butadiene plant for conversion to general chemical manufacture seem to be diminishing. The bill to sell the plant, passed by the House (*CW, Feb. 16, p. 23*) last week ran into the expected opposition from farm-bloc senators, who see the plant as an outlet for grain surpluses (*CW Washington Newsletter, March 9*), want to hold off Senate approval until a White House study group's report on the industrial use of farm crops is available in June.

Publicker Industries, which wants the Louisville plant kept for making butadiene from alcohol, wants to buy government-owned low-grade corn at cut prices, process it into chemical products for sale abroad. Agriculture Secretary Benson is mulling over the proposal, but his aides feel that grain surpluses wouldn't be substantially cut by the plan. Residues after distillation, they claim, make a better animal feed than the unprocessed corn.

Highest fines ever levied in antitrust suits were slapped on the six rubber companies charged with fixing prices and conspiring to control trade in rubber belting.

Federal District Judge Jean S. Breitenstein assessed Gates Rubber, Dayton Rubber, and Goodyear $30,000 each; B. F. Goodrich, $25,000; U. S. Rubber, $20,000; and Boston Woven Hose, $10,000.

The Appeals Court of Alberta has ruled in favor of the New British Dominion Oil Co., defendant in a suit brought by Mid-Con Oil & Gas Co. to recover half of the preferred and common stock New British owns in Northwest Nitrochemical Corp. (Remainder is owned by Commercial Solvents, among others.) Stock involved in this suit is worth an estimated $2 million, so Mid-Con may appeal again—this time to the Supreme Court of Canada.



Permutit Water Demineralizer at Valley Steam Plant, Los Angeles, Calif.

144,000 gallons of water a day... and far too good to drink!

Valley Steam Plant's water is clean and clear enough to drink as it comes in . . . but it's not nearly good enough to make steam in their modern high-pressure, high-efficiency boilers! The 132 parts per million of dissolved solids (iron, limestone, salts, silica and just plain dirt) are low for city waters . . . but they would form heat-wasting, dangerous scale in the boilers and turbines.

The Demineralizer reduces these solids from 132 parts per million to less than one! That's 99.9999% pure!

What's *your* water problem? Do you need soft water for boilers or heaters? Salt-free rinse water to prevent paint blisters? Clear, tasteless, odorless water for drinking or bottled beverages? Do you want to recover valuable metals from plating wastes? Remove impurities from chemicals, syrups?

Whatever you want done with water on a private, industrial or city-wide scale . . . we'd like to discuss it with you. Write to The Permutit Company, Dept. CW-3, 330 West 42nd Street, New York 36, N. Y. or Permutit Company of Canada, Ltd., Toronto 1, Ont.

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Water Conditioning
Ion Exchange • Industrial Waste Treatment

	Sales '56 ($ million)	Change from '55	Net '56 ($ million)	Change from '55	Profit margin '56
Allied Chem. & Dye	668.9	up 15.5 %	47.0	down 9.8 %	7.0%
Amer. Cyanamid	500.7	up 11.0 %	44.2	up 17.9 %	8.8%
Amer. Potash	41.8	up 50.6 %	5.1	up 25.7 %	12.2%
Atlas Powder	67.1	up 11.2 %	4.2	up 20.8 %	6.3%
Commercial Solvents	58.7	up 3.6 %	2.8	down 18.0 %	4.8%
Diamond Alkali	121.3	up 9.7 %	10.4	up 22.9 %	8.6%
Dow[2]	599.6	up 15.0 %	55.9	up 13.6 %	9.3%
Du Pont	1,888.4	down 1.1 %	254.8	down 12.9 %	13.5%
Gen. Aniline & Film	133.7	up 10.2 %	5.1	up 21.5 %	3.5%
Hercules Powder	235.9	up 4.1 %	17.7	down 6.9 %	7.5%
Heyden-Newport	46.5	up 0.8 %	2.6	down 1.0 %	5.5%
Hooker[2]	110.0	up 5.5 %	11.5	up 1.1 %	10.5%
Interchemical	111.1	up 10.6 %	4.7	down 1.0 %	4.2%
Intl. Min. & Chem.[1]	100.9	up 6.6 %	6.8	up 41.9 %	6.7%
Merck	172.4	up 9.2 %	20.2	up 17.9 %	11.7%
Monsanto	541.8	up 3.7 %	38.6	down 8.4 %	7.1%
Pennsylvania Salt	72.4	up 6.8 %	3.6	up 4.1 %	5.0%
Pfizer	178.4	up 8.9 %	18.3	up 19.1 %	10.2%
Reichhold Chem.	59.3	up 10.6 %	1.7	down 11.6 %	3.2%
Rohm & Haas	164.1	up 1.5 %	16.1	down 9.0 %	9.8%
Spencer[1]	46.8	up 18.7 %	5.8	up 13.4 %	12.5%
Stauffer	159.2	up 15.3 %	13.7	up 2.3 %	8.6%
Texas Gulf Sulphur	84.6	down 9.6 %	28.1	down 13.0 %	33.3%
Union Carbide	1,324.5	up 7.6 %	146.2	up 0.3 %	11.0%
Victor	50.1	up 3.7 %	3.7	down 7.5 %	7.3%
	SEMICHEMICALS				
Air Reduction	169.8	up 13.8 %	15.7	up 36.0 %	9.3%
Eastman Kodak	761.7	up 6.6 %	94.7	up 10.6 %	12.4%
Celanese	188.3	up 6.1 %	16.9	up 10.2 %	9.0%
Food Machinery[6]	300.0[6]	up 13.4 %	15.8[6]	up 6.7 %	5.3%
Koppers	305.6	up 33.8 %	12.1	up 16.1 %	4.0%
National Distillers	543.1	up 8.6 %	20.1	up 29.6 %	3.7%
Olin Mathieson[6]	605.0[6]	up 7.4 %	47.2[6]	up 5.5 %	5.3%
Pitts. Coke & Chem.	59.7	up 5.5 %	3.9	up 2.7 %	6.6%
Rayonier	137.9	down 3.2 %	14.0	down 6.6 %	10.1%

[1] calendar year
[2] 12 months to Nov. 30
[3] privately held, no dividends
[4] not adjusted for Newport merger
[5] plus stock dividend
[6] estimated
[7] govt. held, no dividends

Earnings Hold Up, but Some Weak

It's pretty evident from the annual reports that have blossomed forth in the last fortnight that chemical earnings for 1956 have managed to hold their own.

While some have dropped from 1955's record peak, there hasn't been any industry-wide downturn, as some observers predicted earlier last year. In fact, companies represented in *CW*'s latest financial survey show an average profit gain of 6.7%. But despite this encouraging performance, there are some specters in the earnings picture that can't be overlooked.

Sagging Margins: Still to be reckoned with are sagging profit margins. As sales continue a healthy rise, profits also are generally going up—but not as fast. The resulting pinch in profit-to-sales ratio is spelled out by comparing this year's profit margins with those in '55 and '54. They reached a peak in '55, but are now beginning to slack off. Though it isn't true in every case, most of the bigger companies failed to match last year's profit ratios even though they may have had a substantial boost in sales.

Annual reports also indicate that companies just don't have as much cash on hand as they used to. While big outlays financed ambitious expan-

Profit margin '55	Profit margin '54	'56 ratio comm. stock div. to earn./share	'55 ratio comm. stock div. to earn./share	'54 ratio comm. stock div. to earn./share
8.3%	8.1%	47.5%[5]	55.0%	65.8%
8.6%	6.8%	65.3%	61.4%	67.8%
14.4%	10.6%	28.4%[5]	39.3%	45.7%
5.8%	4.6%	42.8%	48.9%	49.4%
6.1%	5.2%	93.4%	76.4%	99.8%
7.6%	5.9%	41.1%[5]	44.4%	70.1%
9.4%	7.5%	43.6%[5]	47.0%	70.4%
16.1%	15.0%	79.3%	75.5%	75.0%
3.4%	2.4%	[7]	[7]	[7]
8.4%	7.5%	51.6%	47.8%	58.8%
5.5%	4.0%	74.1%	50.0%[4]	250.0%[4]
11.2%	10.6%	57.1%	55.8%	55.9%
4.7%	4.1%	48.1%	42.6%	43.7%
5.0%	6.2%	58.6%	85.1%	68.1%
9.9%	8.7%	52.1%	57.1%	73.4%
8.1%	7.9%	55.6%	46.3%	56.9%
5.1%	5.8%	63.4%	66.0%	76.1%
9.4%	10.4%	52.1%	52.7%	45.8%
3.9%	0.7%	[3]	[3]	[3]
10.9%	9.4%	15.8%[5]	11.6%	13.3%
13.1%	14.0%	51.4%	59.4%	62.7%
8.6%	7.9%	55.1%[5]	36.5%	43.0%
34.1%	35.3%	71.2%	61.9%	60.0%
11.9%	9.7%	64.8%	62.0%	80.6%
8.2%	8.5%	69.3	67.1%	64.4%
8.0%	5.1%	44.0%	46.7%	76.9%
12.0%	7.9%	51.7%	47.2%	50.1%
8.7%	4.5%	30.0%	27.5%	193.7%
5.6%	3.9%	42.6%	44.0%	52.4%
4.5%	3.3%	79.8%	50.8%	90.3%
3.1%	2.8%	47.3%[5]	62.5%	72.5%
8.0%	7.6%	57.0%[6]	57.0%	64.3%
5.5%	3.0%	33.3%[5]	53.2%	140.8%
11.2%	13.6%	52.9%	62.7%	34.1%

Spots Are Evident

sion programs launched this year and last, payments of usual cash dividends were continued—even though earnings may have been off slightly. This shows up in reports by 11 firms (*see table*) that reported lower earnings last year, yet whose ratio of dividends per share to earnings per share increased. There's a time lag before decreased earnings are reflected in dividends.

Good Last Quarter: Fourth-quarter results were the real saver—considerably better than in other '56 quarters.

It was the larger firms that had more of the difficulties. Many had trouble matching 1955's figures. This may be due—paradoxically—to their greater diversification and their dealings with large numbers of suppliers and buyers, a situation that caused them to conform faster to the overall economy.

New Profit Rules?

The earnings figures to the left would have been different if a just-proposed corporate tax change had been in effect last year. With small business aid as a goal, Sen. W. J. Fulbright (D., Ark.) will offer an amendment to the corporate income and excise tax extension bill that could raise corporate federal income taxes to 53% from the present 52%.

The current corporate tax takes 30% of all profits, plus a 22% surtax on all profits in excess of $25,000. Under the new plan, the normal tax on all profits would be lowered to 22% and the surtax raised to 31% of all profits over the $25,000.

Where It Hits: The bigger companies will feel the bite of the extra 1%. A firm with profits less than $225,000 will pay less tax, but one earning more than $225,000 will pay more than before. For example, here's what it would mean for three chemical makers (using '56 earnings figures):

- Union Carbide, with a net of $292.3 million before taxes, set aside $146.1 million for federal taxes and renegotiation last year. The company estimates that it would have to spend about $2.8 million more, or $149 million, under the proposed law.
- Koppers Co. earned $24.2 million before taxes, set aside $10.8 million for federal taxes. The proposed bill would raise this by about $230,000, to $11 million.
- Spencer Chemical had a net of $12.2 million before taxes, set aside $6.4 million. Under Fulbright's bill, it would have to set aside $6.5 million.

Growing Opposition: In each of these cases, the increase would be in the neighborhood of 1.7-1.9%, and because of this, opposition is forming. Although Fulbright has a third of the Senate lined up, he has lost some of the sponsors—mainly Republicans. They favor a straight switch instead, without the extra 1%.

Because of the House's gag rule on the tax extension bill, the Fulbright proposal won't be debated until it gets to the Senate Finance Committee. It's too early to figure the bill's chances, but it is almost certain to come to a vote on the Senate floor.

In 1952, before their merger,

ST. HELENS

Was a fully integrated pulp, paper and paper product manufacturer

Marketed its products primarily in the 11 Western states

Sold $9.2 million worth of products

Made 12.1% of all coarse paper produced in the West

ZELLERBACH

Was a fully integrated pulp, paper and paper product manufacturer

Marketed its products primarily in the 11 Western states

Sold $253 million worth of products (including sales of its Canadian subsidiaries)

Made 51.5% of all coarse paper produced in the West

After merger in June '53, CZ

Still has its major market area in the 11 Western states

Is a fully integrated pulp, paper and paper product manufacturer

Sold $414 million worth of products (in 1955)

Made 64.0% of all coarse paper produced in the West

SOURCE: FEDERAL TRADE COMMISSION

Paper Merger Faces Battle

Crown Zellerbach last week felt the full bite of the beefed-up antimerger law. The Federal Trade Commission ordered the company to completely unload its St. Helens Pulp & Paper Co. acquisitions. The clear-cut order came after a ruling by FTC hearing-examiner, Earl Kolb, that CZ violated the 1950 amendments to Sec. 7 of the Clayton Act when it bought St. Helens back in '53.

The case, which CZ will appeal, sets the stage for the first court fight to settle just what the antimerger law means and whether it can successfully be used to separate corporate assets of two or more companies after they've been merged.

Prior Cases: True, there have been a few antimerger cases that ended with either the sale of some of the acquired assets or in restrictions on acquired voting stock. These were not the result of court decisions, however; settlements were achieved—either by the Justice Dept. or by FTC—through negotiation and voluntary settlements.

Crown Zellerbach is already committed to the first step in upsetting the order—appeal to the five-man FTC. The commission must decide whether to uphold, reverse or change the examiner's ruling; but the betting is that the examiner will be upheld. If the experts are right, this would augur appeal to the courts—all the way to the U.S. Supreme Court, very likely.

Issues: The basic issues Kolb had to decide were:

(1) What is the particular line of commerce involved?

(2) What is the particular market area in which possible anticompetitive consequences of the acquisition are to be measured?

CZ lost its arguments on both points. It contends that the line of commerce (products) involved entails practically all categories of paper produced by CZ and St. Helens. And CZ says that the effect on competition must be tested in the nationwide market.

But Kolb's ruling states that since the greater portion of the production of both companies (*see table*) was coarse papers, this is the product category in which they competed most.

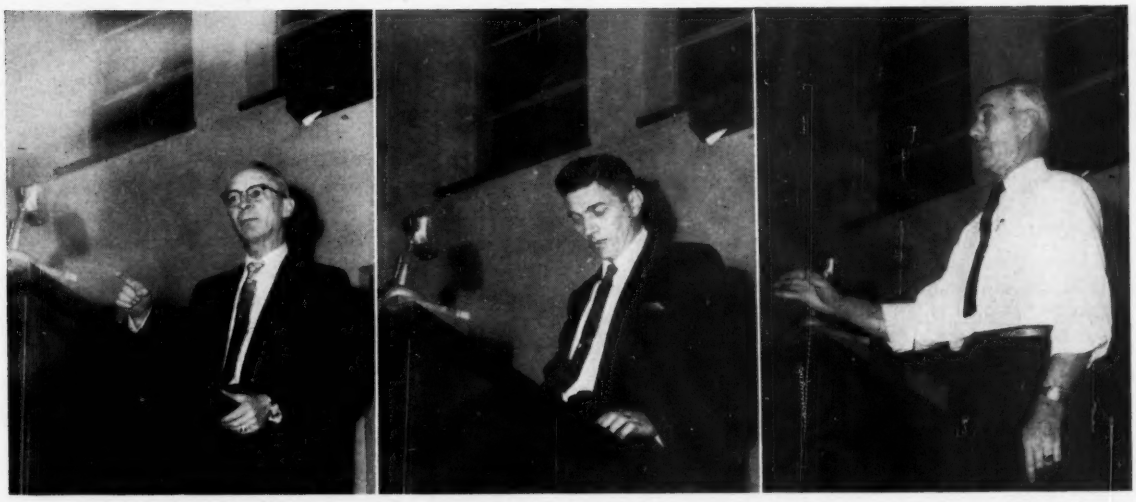
For market area, Kolb describes 11 Western states: Washington, Oregon, California, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah and Nevada. This is the area, he believes, in which the effects of the acquisition must be measured. That's where both companies sold the greater volume of the papers they produced, he says. To use the entire nation as the market area, Kolb rules, would be contrary to the antimerger law provision banning mergers that substantially reduce competition or tend to create a monopoly "in any section of the country."

Kolb cites as further evidence his findings that jobbers in the area—because CZ's principal competition was committed to only three of them—are left "in the precarious position of relying on Crown Zellerbach," which directly competes with them for sales to consumers through its own jobbing division. Kolb concludes that CZ could, if it chose to use all its own production for its own jobbing, put independent West-Coast jobbers and converters out of business.

Moreover, he cites evidence that CZ is the West Coast paper industry price leader. By following Eastern prices, Kolb says CZ makes sure Eastern producers cannot satisfactorily compete in the West because of the necessity for them to absorb freight costs.

CZ's Plunge: An adverse decision, particularly five years hence, would be a mighty wallop for Crown Zellerbach. Already, the company has sunk $20 million into expansion of the St. Helens facilities, in addition to the $9,557,000 worth of stock (now worth $20-25 million) it exchanged for the firm. Merger was closed in Sept. '55.

Obviously, Crown Zellerbach won't take the FTC order lying down. But, in the event it should be required to divest itself of the St. Helens holdings, it's in for still another headache. Reason: there's hardly a company that could afford to buy St. Helens that wouldn't also run into possible antimerger trouble as a result.



OCAW ORGANIZERS: President Knight, Vice-President Swisher, Regional Director Martin address Du Pont employees.

Unions Aim at the Two Biggest Companies

Activity of the Oil, Chemical & Atomic Workers Union last week focused on Du Pont and Union Carbide.

At Du Pont's big Belle, W. Va., plant, a series of sparsely attended organizing meetings was highlighted by Wednesday night's visit from OCAW's President Jack Knight and Vice-President Elwood Swisher. Both were fresh from appearances before the American Institute of Chemical Engineers at White Sulphur Springs, W. Va. Also on hand was Cecil Martin, director of OCAW region 10, recently brought in to push organizing efforts in the area. Reports from local observers indicate the union is trying out new organizing techniques to bring the sprawling Du Pont complex into line.

The moves at Belle—which is not organized and hasn't been since District 50 of the United Mine Workers lost its hold there on a technicality some years ago—are only one portion of current OCAW efforts directed at Du Pont. Organizing meetings are being held at company plants in Memphis, Tenn. (Electrochemicals Dept.), Sabine River, Tex. (Polychemicals Dept.) and Antioch, Calif. (Orchem Dept.). Closest to unionization, it's said, is the latter, situated near heavily unionized San Francisco.

Carbide Cordon: At Carbide's Linde Air Products plant at Essington, Pa., last week, 94 striking union employees voted not to respond to the firm's invitation to come to work at 8 a.m., Thursday morning. Supervisory people and management had the plant operating by 8:30, producing by noon. The plant, along with four other Linde locations, has been on strike for nearly six weeks. It's the first one that Linde has chosen to start up.

About 100 quiet and orderly pickets marched by the gates, offered no resistance to returning management. Bone of contention still, says the union, is over the issue of contract length, outside work contracts, and union shop.

Carbide started up the Essington plant first because it's one of the largest (in terms of capacity) among the five shut down and because, the company claims, employee bargaining groups twice accepted the company's settlement proposals. OCAW, though admitting that bargaining groups acquiesced, claim that when the proposals were submitted to full membership vote, they were turned down.

Linde plant management sat down Monday with federal mediators, as they did twice before, to try for a settlement. Meanwhile the company is writing explanatory letters to its customers.

Write-Off Criteria Studied

In a special meeting last week, officials of the Office of Defense Mobilization started to draw up criteria they'll use in granting fast tax write-offs to companies producing liquid nitrogen and oxygen for use as rocket propellents. The write-offs were offered because ODM will need an additional 4 billion cu. ft./year of the gases for its stepped-up missiles program, and it's hoping the write-offs will draw process firms into production to meet the new goal.

Reports from last week's meeting indicate that one of the chief factors determining who will get write-offs will be whether the fuel maker is geographically near a missiles center —as well as how adequate his transportation facilities are. Other criteria, such as how much amortization will be granted, or whether producers of solid propellents will also be able to qualify for write-offs, haven't been determined.

Reason behind ODM's move is what one agency official termed "a new and sudden defense demand for liquid propellents." The current nationwide output of 25 billion cu. ft./year just about balances demand for the materials. But ODM reports that unless production capacity is expanded, the balance will give way to a shortage.

EXPANSION

Fertilizer: Construction has begun on Coastal Chemical Corp.'s $6-million fertilizer plant at Pascagoula, Miss. Production target: 75 tons/day of nitrate fertilizer, 300 tons/day of phosphoric acid. Coastal reports it is also blueprinting plans for hydrochloric acid and ammonia units.

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Resins: Dominion Rubber Co.'s Naugatuck Chemicals Division is planning a $500,000 polyester resins plant near Elmira, Ont. The plant will boost Naugatuck's annual resin output to "several" million pounds/year.

FOREIGN

Aluminum/Surinam: A $45-million aluminum metal producing plant will be built by Aluminum Co. of America. An accord signed by Alcoa and the government of Surinam—once known as Netherlands Guiana—calls for a joint project to build a hydroelectric power plant which will serve Alcoa's planned aluminum plant and other nearby areas. The plant—first aluminum production unit in South America—will have a capacity of 60,000 tons/year, will take four years to build.

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Paper/Israel: The U.S.-owned American-Israeli Paper Mills will launch an $8-million expansion program at its plant at Hadera. The paper plant's capacity will be increased from 15,000 to 30,000 tons/year, and a 50-tons/day straw pulp plant will be added.

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Synthetic Rubber/West Germany: A $38-million synthetic rubber plant has been started by Bunawerke Huels. Operations are scheduled to begin in the summer of '58, with an annual capacity of 45,000 tons of Buna Huels K, a polymerized butadiene-styrene emulsion. Due to the high cost of the project, the primary sponsor, Chemische Werke Huels, has secured financial assistance from other I. G. Farben successor companies. Huels holds 50% of the stock; Bayer 16⅔%; Badische Anilin- & Soda-Fabrik, 16⅔%, and Hoechst, 16⅔%.

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Epoxies/West Germany: A 2,000-tons/year epoxy resin plant will be built at Wesseling by Deutsche Shell AG. (a Royal Dutch affiliate) and Badische Anilin- & Soda-Fabrik (Ludwigshafen). Production should begin by the middle of '58.

•

Superphosphate/Australia: Sulfuric acid and superphosphate production facilities of Sulphide Corp. Pty. Ltd. will be increased as part of a $20-million expansion project that will include erecting a new zinc smelter. Superphosphate production will be more than doubled to a capacity of 430,000 long tons/year. Sulfuric acid will be raised from 30,000 to 45,000 l.t./year. The plants will be built at Cockle Creek near Newcastle, N.S.W.

•

Synthetic Rubber/Japan: The Japanese government will invest $3.9 million in a new corporation to manufacture synthetic rubber. A similar amount will be invested by private firms. The company will have facilities to produce 27,000 tons of general-purpose synthetic and 3,000 tons of latex by 1959. By '62, according to plans, it will be producing 40,000 tons of general-purpose rubber and 5,000 tons of latex.

•

Ammonia/Japan: Chemical Construction Corp. (New York) will design a new ammonia plant for Asahi Chemical Industry Co. that's to be built at Nobeoka, on Kyushu, Japan's southernmost island. The factory will have a capacity of 50 metric tons/day, will use the Texaco oil-gasification process.

COMPANIES

Grace Chemical Co. will take over an anhydrous ammonia plant now operated by American Vegetable Oils Corp. in Lumberton, Miss. A new operating firm—South Mississippi Ammonia Distributors—will be established to run the plant.

•

A. M. Byers Co. stockholders will vote at a special meeting May 7 on a proposed 3-for-1 split of the company's common stock (75% owned by General Tire & Rubber). Terms call for splitting each existing share of no-par common into three shares of $3-par common. The proposal also calls for an increase in the number of authorized shares and an increase to $15 million in authorized indebtedness.

•

El Paso Natural Gas Co. plans to raise $45 million by selling 450,000 shares of its preferred stock in two separate offerings. The first, 150,000 shares of $100-par first-preferred, will be marketed publicly through the White, Weld & Co. brokerage house.

The second issue, consisting of 300,000 shares of no-par convertible second-preferred stock, will be offered to stockholders.

Proceeds from the sale will be used to expand the El Paso system and to pay off about $25 million in bank loans.

•

Scurry-Rainbow Oil Ltd. and Canadian Pipelines & Petroleums Ltd. directors have approved a merger of the two firms. If stockholders of both companies approve at a special meeting April 29, Scurry-Rainbow will issue new stock to Canadian Pipelines' shareholders on a share-for-share basis. The consolidated company would retain the name of Scurry-Rainbow Oil Ltd.



BIG SAVINGS

in synthetic rubber shipments

Chemical companies report impressive savings... up to $17 per thousand bags... in export synthetic rubber shipments by switching from conventional paper bags with burlap overslips to Bemis Waterproof (laminated-textile) Bags.

Lower package costs and labor savings (due largely to elimination of double handling) make this possible.

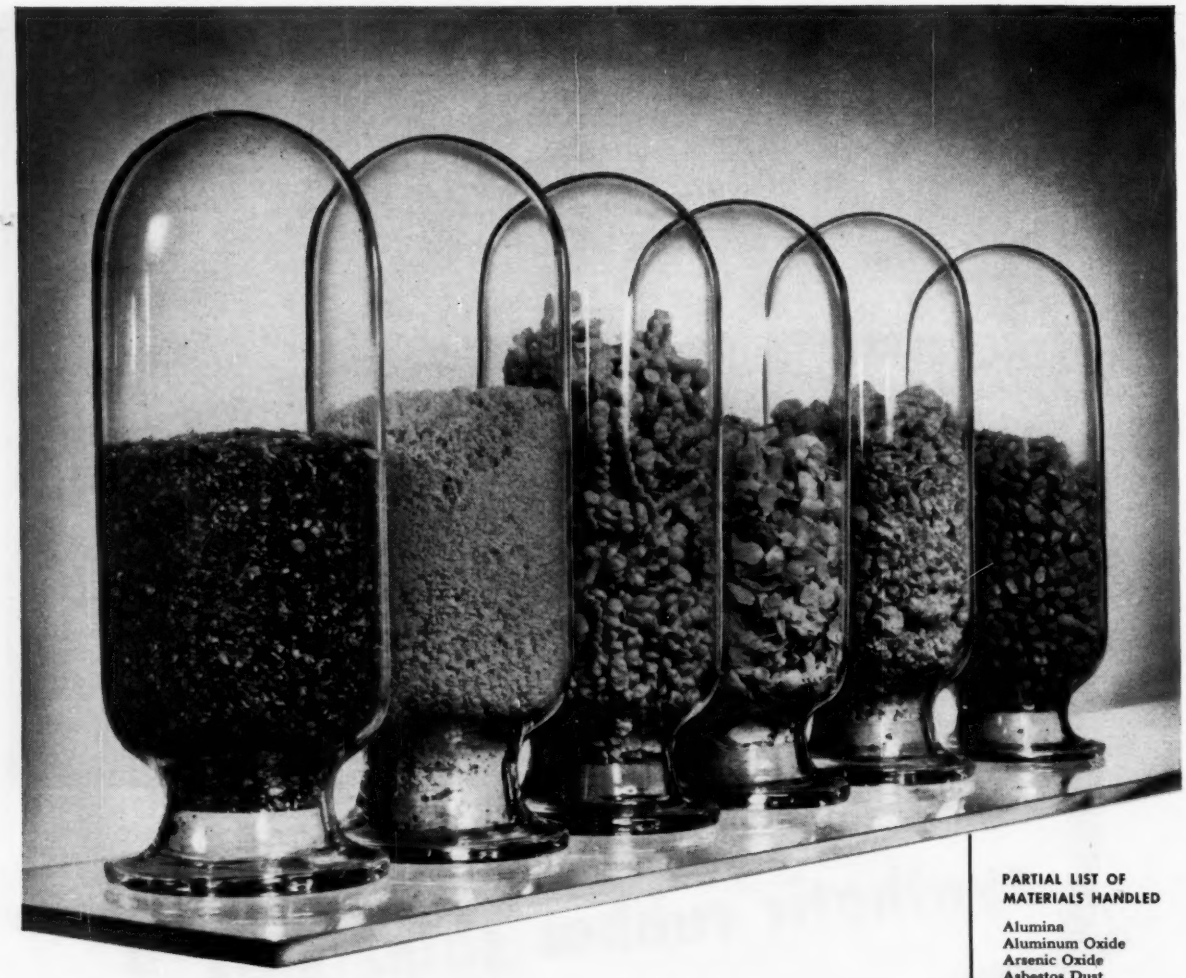
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Bemis Waterproof Bags make neater, more compact, better stacking packages . . . and Bemis "clay-coats" the inner plies to make filling and emptying easier and faster. Get the *complete* story about Bemis Bags for synthetic rubber.

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Cement Raw Material
Chalk
Clays
Coal, pulverized
Detergent Powders
Diatomaceous Earth
Feeds, soft
Fertilizers
Flour
Flue Dusts
Fly Ash
Gypsum (raw or calcined)
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Washington
Newsletter

CHEMICAL WEEK
March 16, 1957

The fight for a new antidumping law is shaping up fast. Sen. Warren Magnuson (D., Wash.) last week wrote to 52 Senate colleagues asking that they join in sponsoring six major amendments that would convert the 36-year-old antidumping statute into a strong, broad instrument to protect domestic industries against low-priced imports.

It reflects the snowballing sentiment (*CW, Nov. 24, '56, p. 23; Jan. 26, p. 31*) expressed by organic chemical makers and other high-tariff groups to shift U.S. import-export policy away from the "free trade" principles that took root in the 1930s. Though President Eisenhower is committed to a similar philosophy, his aides fear he'll have a hard time stemming growing Congressional protectionism.

First test will come in the House Ways & Means Committee, where all revenue measures must originate. Rep. Hale Boggs (D., La.) has a staff study of antidumping under way in preparation for subcommittee hearings that will probably come in April. He's looking over a half-dozen bills similar to Magnuson's, along with recent Treasury Dept. proposals for minor technical changes in the law.

But Magnuson's move has the Administration worried. In the past, it has been able to count on Southern Democrats, coastal state and liberal legislators in the Senate to kill protectionist bills voted by the House. Last year, cotton-bloc senators broke away from this traditional free-trade alliance. There will be wholesale defections this year.

•

FBI agents have begun their annual rubber industry tour. They're visiting rubber-making and rubber-consuming plants, gathering data for the Justice Dept.'s report to Congress on competition in the industry. Interviewers have more than 50 queries for GR-S, butyl and butadiene makers—including 15 on butadiene patents alone.

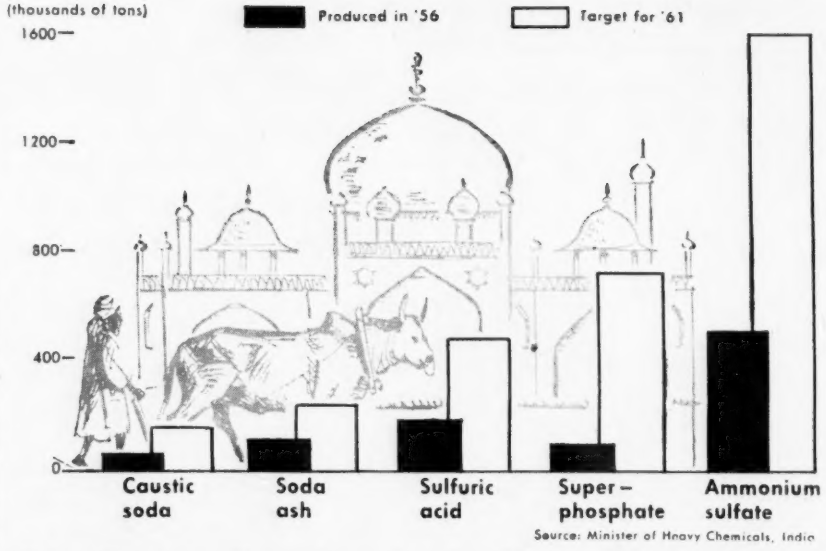
•

Interior Dept. officials were hauled on the carpet last week for promising plentiful water supplies to drought areas by solving saline water conversion problems. The House Interior Committee challenged Assistant Secretary Fred Aandahl and his aides to "put up or shut up" on the widely publicized promise of an atom-powered nationwide network of pipelines carrying desalted ocean water "in the not too distant future." The comment occurred in a speech presented by Aandahl.

Aandahl admitted to the committee that this optimism doesn't square with the results to date, added that estimates of desalting costs have actually been revised upward. But with more funds, the department's research will hit full stride next year—may be ready for pilot-plant tests in 1959. Committee Chairman Clair Engle (D., Calif.) says he may ask Congress to make states involved pay half the pilot-plant cost.

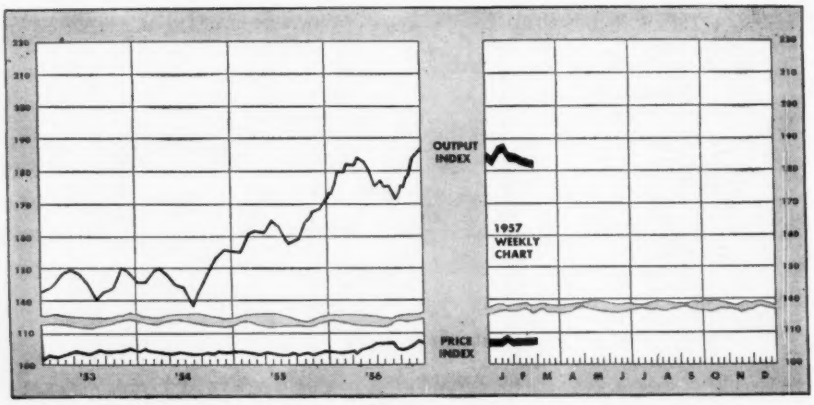
Charting Business

CHEMICAL WEEK
March 16, 1957



Big Boost Coming in India's Chemicals

INDIA, in the last 10 years, has experienced a strong, steady buildup in many industries—e.g., styrene-butadiene rubber (*see p. 100*) and chemicals. In the heavy-chemicals industry, growth is expected to be striking. By 1961, ammonium sulfate production should jump more than 200%; superphosphate output will likely soar 800% higher; sulfuric acid's close to 200%. India's chemical industry spokesmen say that in most cases these are minimum goals.



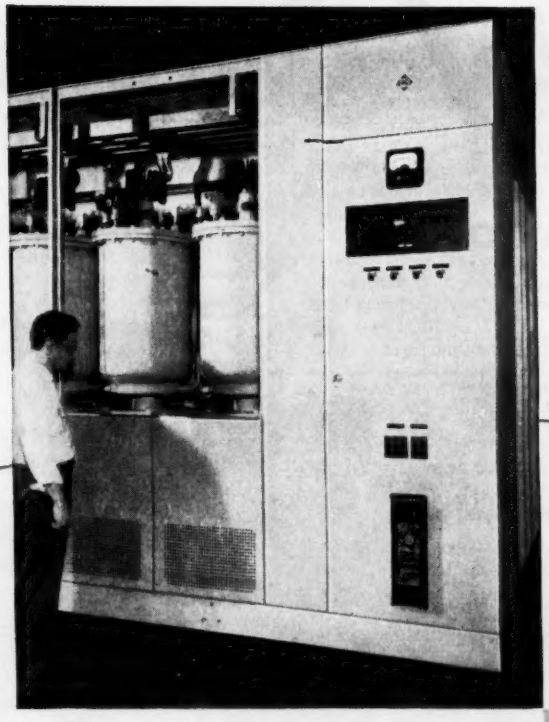
Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	184.4	184.0	182.5
Chemical Week wholesale price index (1947=100)	108.7	108.7	105.6
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	41.89	40.91	41.73(e)

MONTHLY—Foreign Trade (million dollars)	Exports Latest Month	Exports Preceding Month	Exports Year Ago	Imports Latest Month	Imports Preceding Month	Imports Year Ago
Chemicals, total	117.1	86.2	97.1	22.0	25.3	21.6
Coal-tar products	9.1	5.0	5.5	3.9	6.1	4.4
Industrial chemicals	19.0	14.5	14.7	6.8	6.2	7.0

Two Separate Circuits Mean

Reliable Rectifier Operation



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Mercury Arc Rectifiers

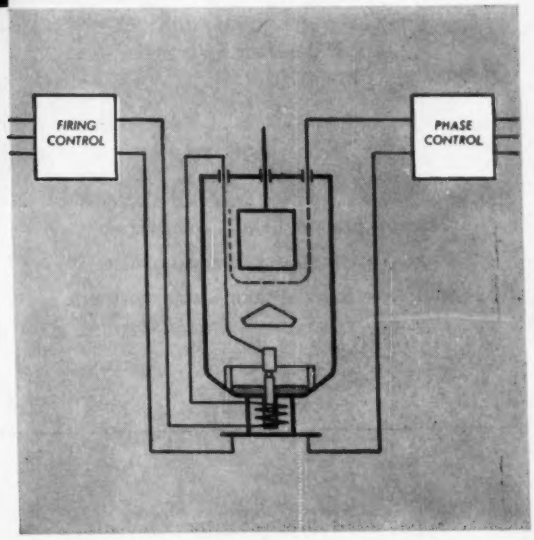
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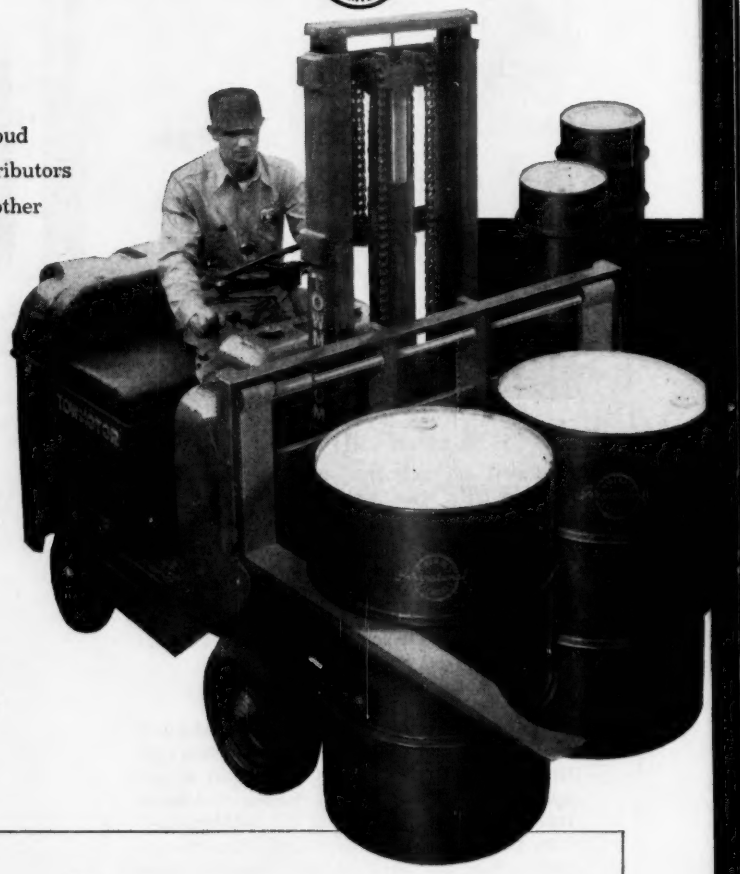
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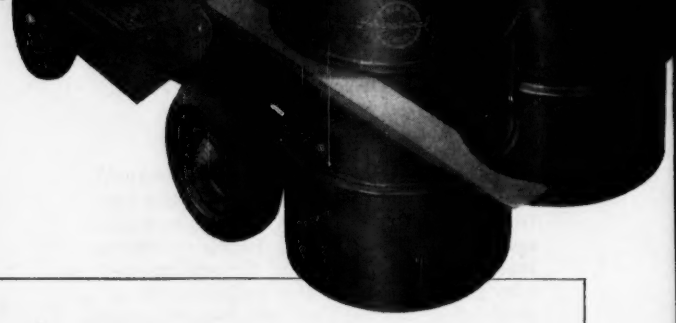
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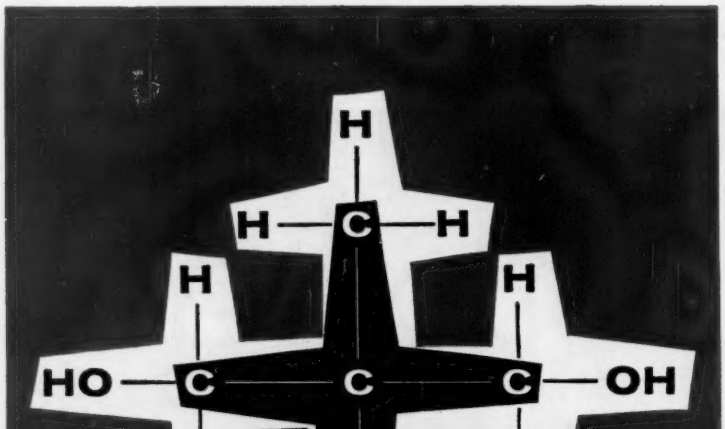
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ADMINISTRATION





NIAGARA FRONTIER'S availability of chemical raw materials like those made in Olin Mathieson's Niagara Falls production complex (above) and water transportation connections from Buffalo harbor (right) highlight...

Niagara's Opportunities for Future Growth

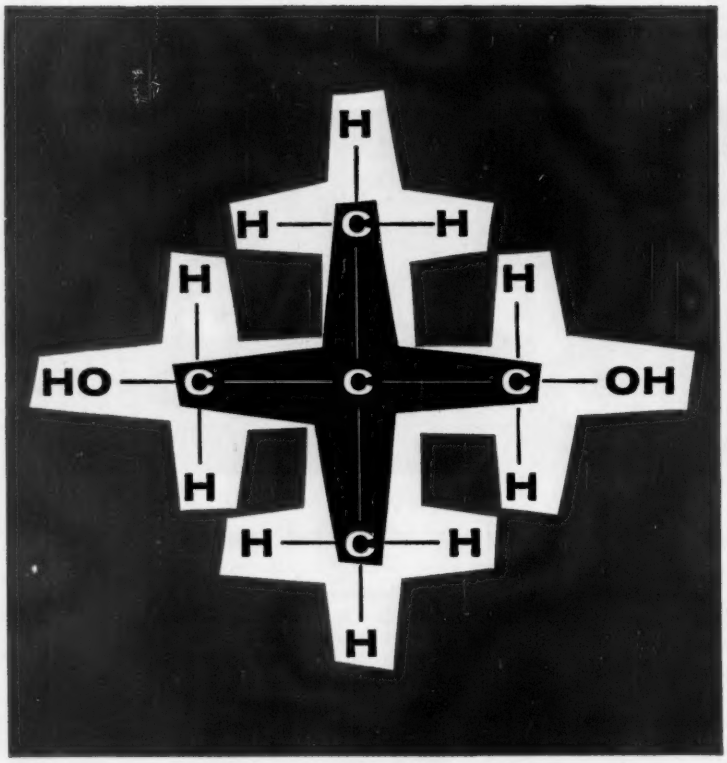
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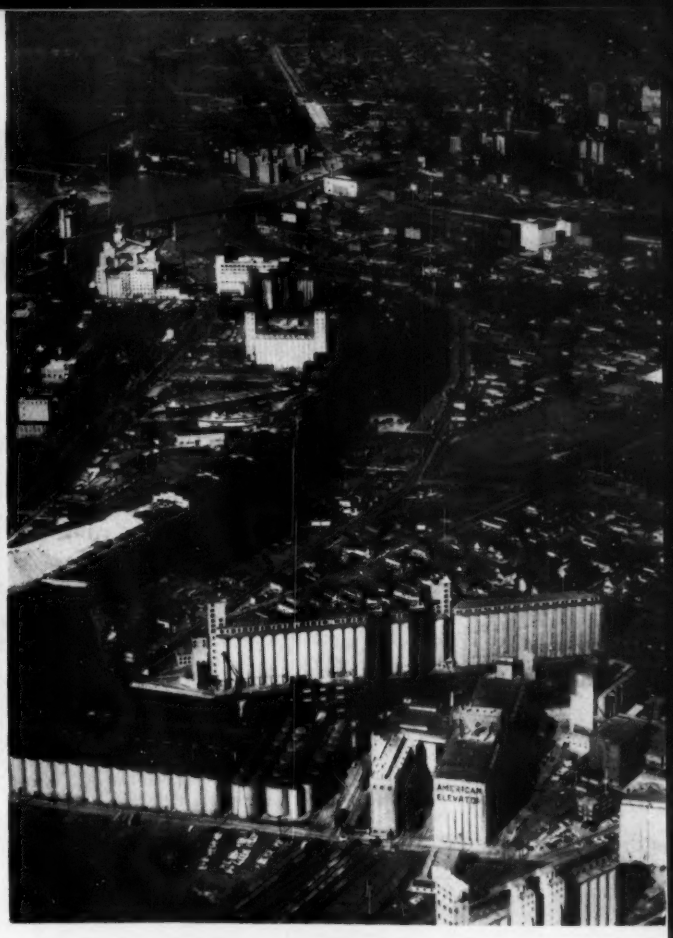
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NIAGARA FRONTIER'S availability of chemical raw materials like those made in Olin Mathieson's Niagara Falls production complex (above) and water transportation connections from Buffalo harbor (right) highlight...

Niagara's Opportunities for Future Growth

No one knows when the Niagara Frontier will have more hydroelectric power, or how much it will cost industrial users, or even who's going to develop it; but this uncertainty isn't stopping chemical industry expansion programs that are based in part on the area's low-rate power.

Hydro power—a resource that has helped make the two-nation Buffalo-Niagara Falls region (*map, pp. 34-35*) a chemical industry stronghold for more than 60 years—is at the center of a political dispute in Washington and Albany as to whether the Niagara River's undeveloped power potential should be harnessed by New York state or by private power companies.

Even while this argument rages on, Niagara Frontier industries have been adopting and carrying out vigorous growth policies. This is particularly true in the case of the larger concerns there; and makers of chemicals and allied products—which now have a nearly 10% share of manufacturing employment in the Buffalo standard metropolitan area—account for more than one-sixth of currently planned expansion in the two counties on the U.S. side of that scenic stream*.

Seaway, Power, Markets: Overweighing the uncertainties of future hydro power supplies and the drawbacks of increasingly restrictive policing on stream and air pollution are these assets:

- By 1959, this area's role as an East-West shipping center—established more than a century ago by the digging of the Erie and Welland Canals—will be enhanced by completion of the St. Lawrence Seaway project, which will enable larger oceangoing ships to come to Buffalo and other Great Lakes ports.
- Significant increases in hydro and steam power generation are coming on both sides of the border, regardless of how the present public-vs.-private development issue is resolved.
- Big new markets are unfolding for various chemical-process materials—zirconium and other atomic-age metals, high-energy fuels, synthetic resins—production and marketing of which will require power and shipping advantages such as the Niagara Frontier has.

Chemical Research Center: As a result, chemical process firms in this area are continuing a buildup program that has boosted local output of chemicals and allied products more than 40% in 10 years.

Sparking this expansion are the region's chemical research teams. Of more than 18,000 persons employed in research work by some 200 companies in

*According to an area-wide survey conducted last year by the Office of Scientific and Industrial Research of Canisius College (Buffalo) in cooperation with the Buffalo Chamber of Commerce.

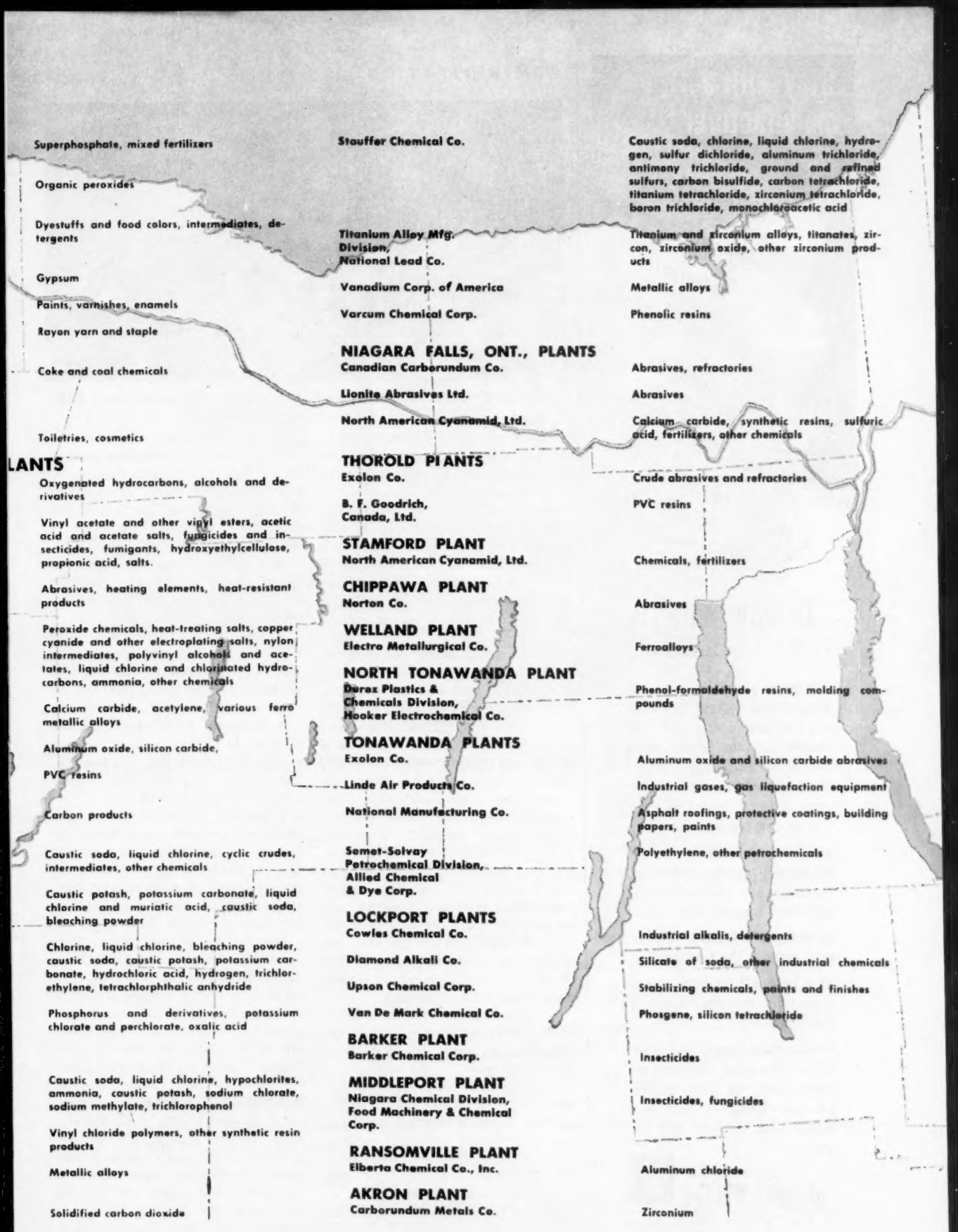


BUFFALO PLANTS

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Analabs Products Co.	Pharmaceuticals
Archer-Daniels - Midland Co.	Vegetable oil processing
Arner Co., Inc.	Pharmaceuticals
Becco Chemical Division, Food Machinery and Chemical Corp.	Peroxygen chemicals
Donner-Hanna Coke Corp.	Coke, benzene, other coke byproducts
Film Dept., E. I. du Pont de Nemours & Co.	Cellophane
Electro Refractories & Abrasives Corp.	Refractories, abrasives
General Chemical Division, Allied Chemical & Dye Corp.	Sulfuric, nitric, oxalic and mixed acids
Interchemical Corp.	Lacquers, enamels, varnishes, paints
International Minerals & Chemical Corp.	
Lucidol Division, Novadel-Agene Corp.	
National Aniline Division, Allied Chemical & Dye Corp.	
National Gypsum Co.	
Pratt & Lambert, Inc.	
Rayon Division, E. I. du Pont de Nemours & Co.	
Semet-Solvay Petrochemical Division, Allied Chemical & Dye Corp.	
Wildroot Co., Inc.	

NIAGARA FALLS, N. Y

Alox Corp.	
Carbide and Carbon Chemicals Co.	
Carborundum Co. (three plants)	
Electrochemicals Dept., E. I. du Pont de Nemours	
Electro Metallurgical Co.	
General Abrasive Co.	
B. F. Goodrich Chemical Co.	
Great Lakes Carbon Corp.	
Hooker Electrochemical Co.	
International Minerals & Chemical Corp.	
Niagara Alkali Division, Hooker Electrochemical Co.	
Oldbury Electro-Chemical Division, Hooker Electrochemical Co.	
Olin Mathieson Chemical Corp.	
Pathfinder Chemical Corp.	
Pittsburgh Metallurgical Co.	
Pure Carbonic Co.	


Superphosphate, mixed fertilizers
Organic peroxides
Dyestuffs and food colors, intermediates, detergents
Gypsum
Paints, varnishes, enamels
Rayon yarn and staple
Coke and coal chemicals
Toiletries, cosmetics
LANTS
Oxygenated hydrocarbons, alcohols and derivatives
Vinyl acetate and other vinyl esters, acetic acid and acetate salts, fungicides and insecticides, fumigants, hydroxyethylcellulose, propionic acid, salts.
Abrasives, heating elements, heat-resistant products
Peroxide chemicals, heat-treating salts, copper cyanide and other electroplating salts, nylon intermediates, polyvinyl alcohols and acetates, liquid chlorine and chlorinated hydrocarbons, ammonia, other chemicals
Calcium carbide, acetylene, various ferro metallic alloys
Aluminum oxide, silicon carbide,
PVC resins
Carbon products
Caustic soda, liquid chlorine, cyclic crudes, intermediates, other chemicals
Caustic potash, potassium carbonate, liquid chlorine and muriatic acid, caustic soda, bleaching powder
Chlorine, liquid chlorine, bleaching powder, caustic soda, caustic potash, potassium carbonate, hydrochloric acid, hydrogen, trichlorethylene, tetrachlorphthalic anhydride
Phosphorus and derivatives, potassium chlorate and perchlorate, oxalic acid
Caustic soda, liquid chlorine, hypochlorites, ammonia, caustic potash, sodium chlorate, sodium methylate, trichlorophenol
Vinyl chloride polymers, other synthetic resin products
Metallic alloys
Solidified carbon dioxide
Stauffer Chemical Co.
Titanium Alloy Mfg. Division, National Lead Co.
Vanadium Corp. of America
Varcum Chemical Corp.
NIAGARA FALLS, ONT., PLANTS
Canadian Carborundum Co.
Lionite Abrasives Ltd.
North American Cyanamid, Ltd.
THOROLD PLANTS
Exolon Co.
B. F. Goodrich, Canada, Ltd.
STAMFORD PLANT
North American Cyanamid, Ltd.
CHIPPAWA PLANT
Norton Co.
WELLAND PLANT
Electro Metallurgical Co.
NORTH TONAWANDA PLANT
Durez Plastics & Chemicals Division, Hooker Electrochemical Co.
TONAWANDA PLANTS
Exolon Co.
Linde Air Products Co.
National Manufacturing Co.
Semet-Solvay Petrochemical Division, Allied Chemical & Dye Corp.
LOCKPORT PLANTS
Cowles Chemical Co.
Diamond Alkali Co.
Upson Chemical Corp.
Van De Mark Chemical Co.
BARKER PLANT
Barker Chemical Corp.
MIDDLEPORT PLANT
Niagara Chemical Division, Food Machinery & Chemical Corp.
RANSOMVILLE PLANT
Elberta Chemical Co., Inc.
AKRON PLANT
Carborundum Metals Co.
Caustic soda, chlorine, liquid chlorine, hydrogen, sulfur dichloride, aluminum trichloride, antimony trichloride, ground and refined sulfurs, carbon bisulfide, carbon tetrachloride, titanium tetrachloride, zirconium tetrachloride, boron trichloride, monochloroacetic acid
Titanium and zirconium alloys, titanates, zircon, zirconium oxide, other zirconium products
Metallic alloys
Phenolic resins
Abrasives, refractories
Abrasives
Calcium carbide, synthetic resins, sulfuric acid, fertilizers, other chemicals
Crude abrasives and refractories
PVC resins
Chemicals, fertilizers
Abrasives
Ferroalloys
Phenol-formaldehyde resins, molding compounds
Aluminum oxide and silicon carbide abrasives
Industrial gases, gas liquefaction equipment
Asphalt roofings, protective coatings, building papers, paints
Polyethylene, other petrochemicals
Industrial alkalis, detergents
Silicate of soda, other industrial chemicals
Stabilizing chemicals, paints and finishes
Phosgene, silicon tetrachloride
Insecticides
Insecticides, fungicides
Aluminum chloride
Zirconium

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($NaHSO_2 \cdot CH_2O \cdot 2H_2O$)

Hydrozin
$Zn(HSO_2 \cdot CH_2O)_2$

Hydrosulfite BZ
($Zn \cdot OH \cdot HSO_2 \cdot CH_2O$)

Hydrosulfite of Soda Conc.
Dustless ($Na_2S_2O_4$)

in any quantity

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AS REDUCING AGENTS, wide application in textile processing, manufacture of pharmaceuticals, and chemical compounds.

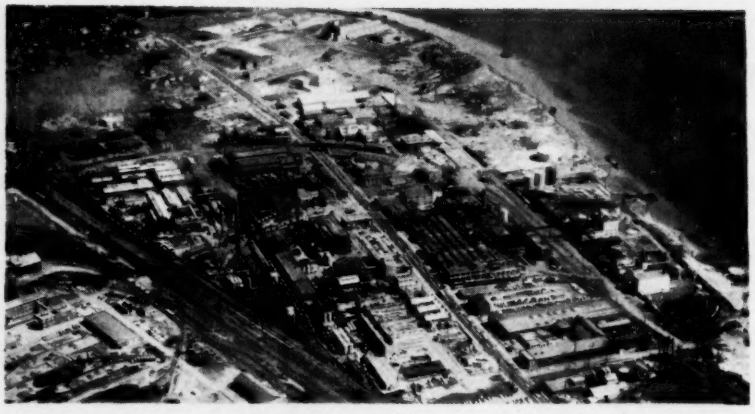
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SHORESIDE SITES: At Niagara Falls, N. Y., 4 chemical plants* above Falls.

the area, a substantial subtotal are in the chemical field. Olin Mathieson has the largest research unit at Niagara Falls, a force of more than 800.

There's no disposition to stand pat on present laboratory facilities. Hooker is planning to build a $1.5-million research center on Grand Island, and Olin Mathieson has obtained clearance for a new research engineering building near its main plant at Niagara Falls, N.Y.

Big Names of the '90s: Among the first of the process companies on the Niagara Frontier was Carborundum Co., which traces its origin to 1891, when Edward G. Acheson produced a few crystals of silicon carbide in a homemade electric furnace. In 1897, Oldbury Electro-Chemical began operating this hemisphere's first commercially successful phosphorus-producing electric furnace; and in that same year, Castner Electrolytic Co.—an antecedent of Mathieson Chemical Corp., which more recently merged with Olin Industries—completed and started operating a caustic soda plant.

Those old-timers of the area are among the most active in current chemical industry expansion plans there. Principal new projects:

• Carborundum. A goodly portion of the firm's $30-million capital expenditures program in 1957-58 is planned for plants in the area.

• Durez Division, Hooker Electrochemical. A $500,000 plant is being built in North Tonawanda to make new dry-granular polyester molding powders (*CW Business Newsletter, Feb. 23*).

• Olin Mathieson. About to start construction of a $36-million plant at Model City (near Niagara Falls, N.Y.) to produce high-energy aviation fuel for U.S. Air Force, the firm is also building a smaller plant—again at Model City—for a Navy fuels job.

• Pathfinder Chemical (Goodyear subsidiary). First phase of its current $4-million expansion program will be completed this year.

• Semet-Solvay Division, Allied Chemical. The firm will begin production of low-pressure polyethylene plastic at its Tonawanda plant "in the not-too-distant future."

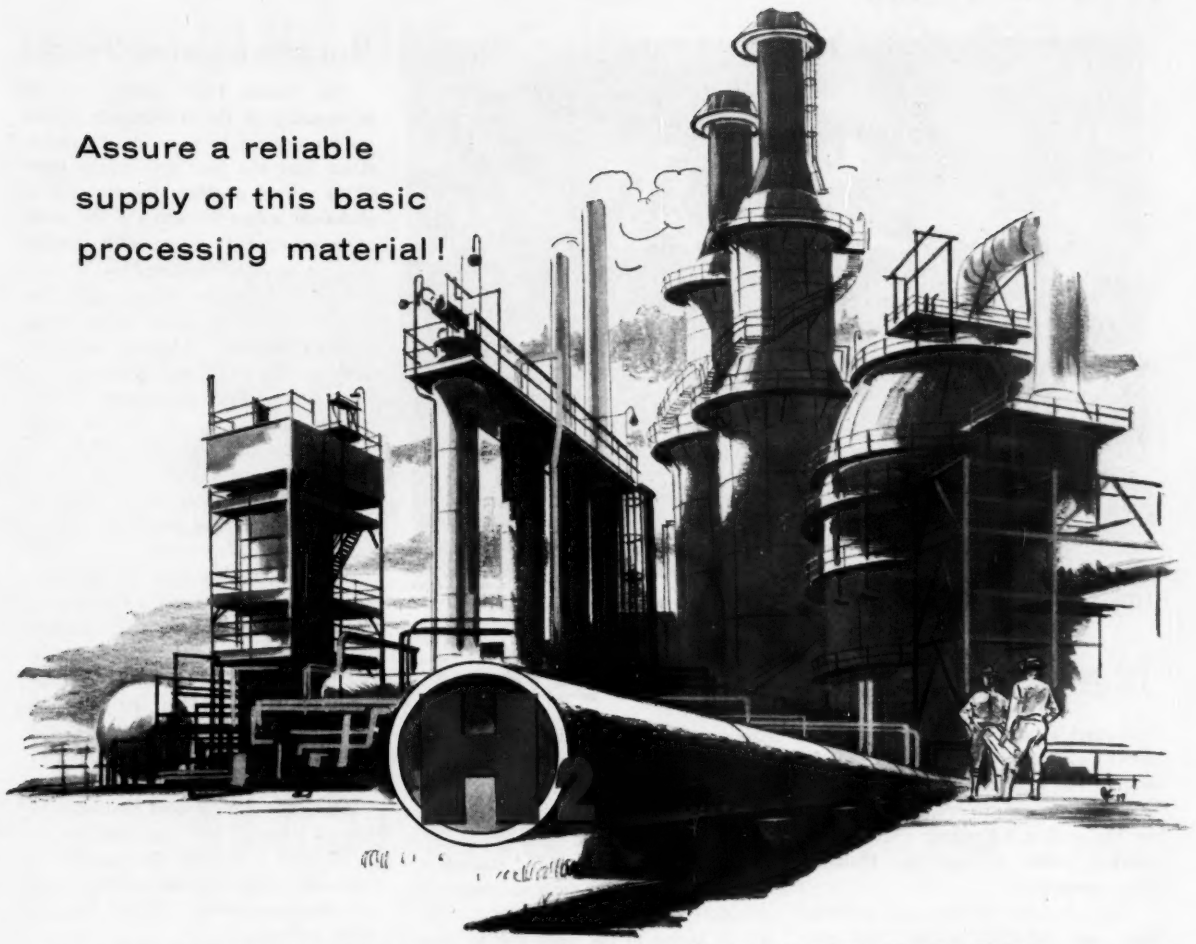
• Titanium Alloy Mfg. Division, National Lead. Expansion of facilities at Niagara Falls, N.Y., is planned. Capacity for zirconium oxide and silicate will be increased by July 1.

• Stauffer Chemical. New unit which will produce boron trichloride in tank-car quantity for first time in U.S. is ready to go onstream; increased output of other metallic chlorides is planned as part of a $1-million expansion at Niagara Falls, N.Y.

For the foreseeable future, main events include opening of the St. Lawrence Seaway (to be ready by '59); the projected 80% increase in electric power available for local consumption (could be ready by '60); and major expansion plans of the Niagara Frontier's other big chemical-consuming industries—steel, autos, aviation, grain milling, machinery and other metal products. With such developments on the horizon, it's not surprising that the area's chemical concerns—like Hooker, which expects to spend about $75 million over the next five years for new facilities—are "thinking big" about further growth.

*Hooker Electrochemical's main plant; Hooker, Oldbury and Niagara Alkali divisions; and Alox Corp. Top center, city of Niagara Falls' $8-million water-treatment plant.

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RICHARD PERVIN

HOUSTON TURNING BASIN: Site of $12 million in improvements.

New Era for Port Houston?

Chemical process companies using Houston, Tex., port facilities will be among the beneficiaries of a $12-million improvement program destined to make it a lot easier to ship and receive goods through the Houston ship channel.

The program includes these items: three new wharves costing $3.9 million; two $300,000 transit sheds to be erected on the new wharves; $1.75 million worth of additions and improvements in the port's rail facilities, including a $39,000 passing track between Olin Mathieson Chemical Corp. and Phillips Chemical Co. plants; $200,000 worth of paving for wharves and access roads; and a $550,000 foreign trade center to be housed in three new floors in the navigation district headquarters building. Funds for this part of the program will come from a $7-million bond issue approved by Harris County citizens in January.

Also included in the improvement program, but to be financed via a $5-million revenue bond issue, will be new and improved port shops and repair facilities, new storage facilities and locomotive cranes, and the rehabilitation of existing wharves.

Traffic Improvements: The program —which had been blocked by voter refusal to approve the bond issue when it previously was voted upon in '56—is expected to give flexibility to the forwarder and shipper by permitting the shipping of goods to the wharves several days before they are to be loaded aboard the ships.

Currently, because of the acute lack of storage space, certain chemical products, among others, are permitted to arrive at the port just in time to be loaded directly aboard the ship from rail cars or trucks. If rail delays should cause the products to arrive late, it is possible they would have to wait several weeks for a second ship bound for the same destination.

After defeat of the bond issue last year, civic groups, the Chamber of Commerce and three Houston newspapers banded together, determined to get a favorable vote the next time around. Highlight of the intensive and successful campaign was a 2½-mile get-out-the-vote parade led by 80-year-old F. M. Law, First City National Bank consultation chairman.

With passage of the bond issue, port authorities were prepared for immediate action, having already determined the most suitable types of facilities to be installed. One major decision: to use wharves (parallel to the shoreline) instead of piers.

Chemical executives in the area, along with city and port officials, are heralding the program as "the start of a new era for the port of Houston."

Nationalization Target

The British Labor party's success in winning all the parliamentary seats up for contest in a series of by-elections over the past few weeks highlights a real problem for the British chemical industry—and for the management of U.S. firms with subsidiaries in the United Kingdom.

One of the foremost nationalization targets of Britain's Labor party is the chemical industry. While reports vary as to the degree of nationalization the party would seek—if it gains control of the government in the elections that must come by 1960, if not before—there appears to be no doubt that Laborites would make a strong bid to gain effective control of British chemical manufacturing.

What would happen to Britain's chemical industry under a Labor government? The present situation in iron and steel—the industry was nationalized by the Laborites, is being denationalized by the present Tory regime —may indicate that at least from the investment point of view, all may not be pessimistic.

The Labor government nationalized 98% of Britain's iron and steel industry in Feb. '51. This represented 91 companies and their subsidiaries, and cost the government £245 million ($686 million).

By last September, the Tories had returned to private interests only about half of the nationalized companies. Sale price: about £188 million ($526 million). Denationalization continues, and the next big step probably, will be the sale of the giant Steel Co. of Wales.

British government figures indicate the total fixed assets of the iron and steel industry to be approximately £1,000 ($2.8 billion) as of 1955. Assuming that the balance of the industry is sold to private interests for an amount equal to that paid for the part already sold, the government will receive a total of approximately £376 million ($1 billion), or considerably less than the industry's actual worth.

Bigger Threat: But even as Laborites hammer out plans for renationalization of the steel industry and nationalization of chemicals, another plan for gaining control of manufacturing is arising within the party. The plan: to require payment of inheritance taxes in the form of equity shares.

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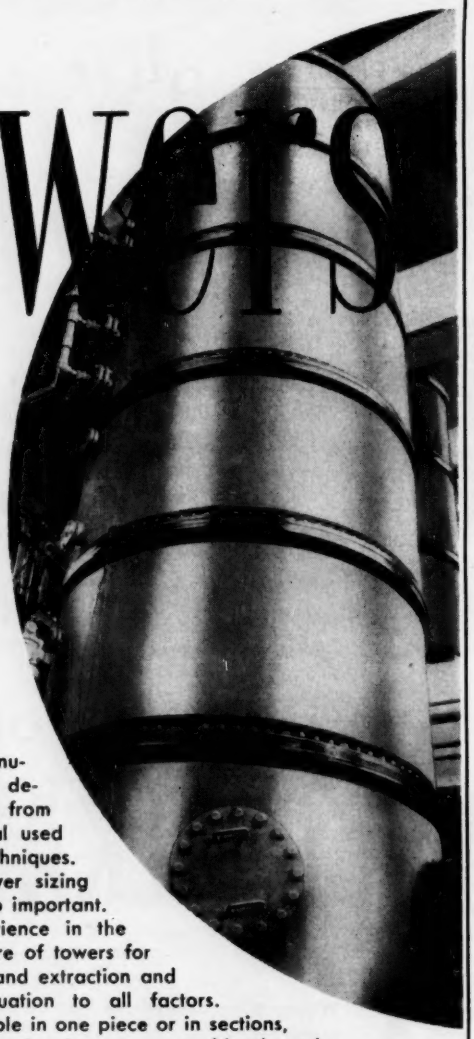
chemicals

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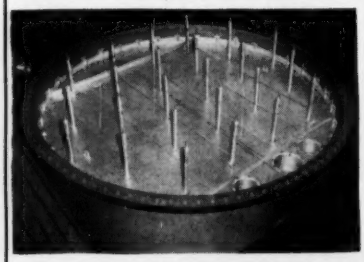
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ADMINISTRATION

LEGAL

Chlorine Gas Damage: A Texas court has ruled that the Columbia-Southern Chemical Corp. (Pittsburgh) is liable for automobile damages allegedly caused by chlorine gas from one of the company's Texas plants.

The company had maintained that not only were there other plants producing similar gases in the area, but also the claims of damages did not take into consideration the condition of the vehicles before the damage occurred. Damage was in the nature of stain and corrosion on the glass and chrome of the cars.

•

Polonium Poisioning Suit: A Cummins-Chicago Corp. (Chicago) employee has filed a civil suit in district federal court (New York) against the Canadian Radium & Uranium Corp. for $500,000 damages, charging negligence.

The suit charges the defendant failed to adopt proper procedure to insure that certain static eliminators were not coated with polonium. The company is also charged with failing to give proper warning of the condition of the eliminators, and with failing to provide adequate protection.

The complaint alleges that the employee unpacked certain static eliminators received from the Sampson Chemical & Pigment Corp., Chicago agent for the Canadian firm. In unpacking the eliminators, he became exposed to dangerous elements and particles, he alleges, which caused him severe burns and injury to his nervous system.

•

FTC and Actumus: The Federal Trade Commission has approved an order requiring Foreign Products Corp. (East Orange, N.J.) and George Dugdale, trading as the Burkleigh Co. (Towson, Md.), to stop misrepresenting the qualities of Actumus, a soil conditioner they sell.

The cease-and-desist order is based on findings that the companies have claimed falsely that Actumus—imported from England: (1) is humus, (2) activates bacteria that create nitrates, (3) creates fertility in the soil, and (4) is entirely natural and 100% organic.

An FTC examiner based the findings on testimony of scientists who stated that Actumus has no effect as a fertilizer.



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ADMINISTRATION

IDEAS

Incentive Plans: Chemical process firms show above-average reliance on performance motivation for their executives.

This is the consensus of a recent N.Y. Board of Trade survey that indicates better than three out of four drug and chemical firms provide incentive plans for their executives.

Among the 284 firms surveyed—employing 450,000 people—life insurance plans are the most widespread, with pensions second and profit sharing next. Still, the firms felt that pension and profit sharing plans are more effective than life insurance.

•

Microscopic Tour: Chas. Pfizer & Co. is conducting a free, guided tour through a microscopic "zoo" for all U.S. high school and college students.

The tour actually will be conducted via 25,000 copies of a 10x20-in. multicolored wall chart depicting 16 microscopic organisms painted as they might appear through a microscope. A key to the chart lists the species and significance of the living creatures that have been harnessed to produce antibiotics, agricultural and industrial chemicals.

LABOR

'De-leveling' of Salaries: An engineering union has come up with an idea to prevent "leveling" of engineers' salaries because starting pay for new engineers rises faster than do other salary levels. The Seattle Professional Engineering Employees Assn.—affiliated with Engineers & Scientists of America—suggests that a company automatically increase all engineers' salaries across-the-board by the same percentage that starting salary rates for new engineers had increased during the preceding year.

•

Unions on Defensive: Recent indications that U. S. labor unions have been losing ground in their struggle for prestige and political, social and economic influence will inescapably mean a further coalescence of unions in chemical process industries. The fact that AFL-CIO's two chemical unions are not faring too well apart may well accelerate the move for their merger—just as it did the merger of CIO's gas-coke-chemical and oil worker unions in March, '55, and the AFL-CIO merger that December. The trend is showing up again in new merger proposals: unification of the United Paper Workers and the International Brotherhood of Paper Makers at a meeting in Chicago; and, too, merger plans for the Glass Bottle Blowers Assn. and the United Glass & Ceramic Workers.

Other events in which the labor movement is not faring well: While the leadership of International Brotherhood of Teamsters (AFL-CIO) is virtually on trial in the special Senate committee hearing in Washington (*see cut*), organized labor was losing a pitched political battle in Indi-



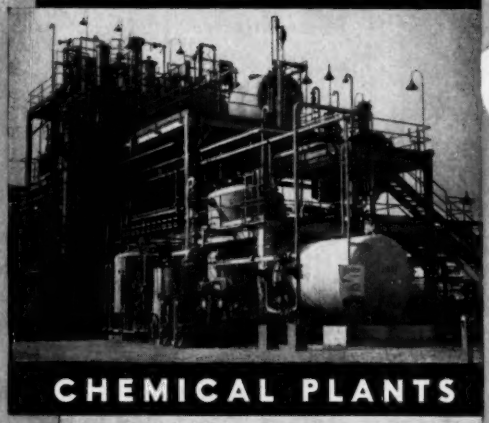
WIDE WORLD

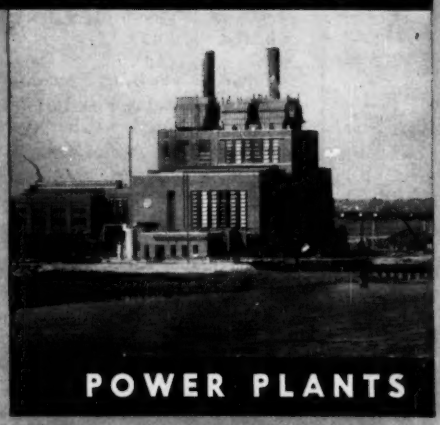
CROSSROADS FOR U.S. LABOR? In Washington, a union goes on trial.

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valves, fittings and flanges by Vogt





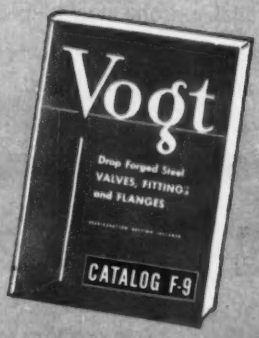


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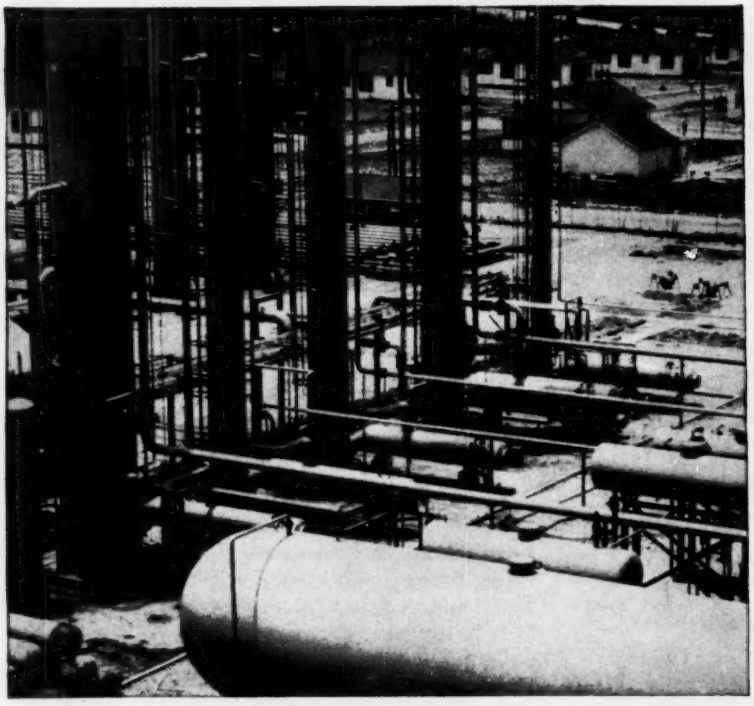


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ADMINISTRATION

ana. The state legislature passed a "right-to-work" bill despite fervent opposition by the state's AFL-CIO organizations, and Governor Harold Handley refused to veto the measure.

Latest black eye for International Chemical Workers Union (AFL-CIO): arrest of five officers of ICWU Local 143 on charges that they stole $300,000 worth of pharmaceutical products from American Cyanamid's Lederle Laboratories Division plant at Pearl River, N.Y. The five men were promptly suspended from union office.

•

'Superseniority' Ruling: The U.S. Supreme Court has upheld the National Labor Relations Board's ruling that Olin Mathieson Chemical Corp.'s layoff of seven workers at the end of an unsuccessful strike at Morgantown, W. Va., was an unfair labor act. The men who were laid off had more seniority than certain other workers who returned to their jobs before the end of the strike and who were not laid off (*CW, June 16, '56, p. 42*).

KEY CHANGES

Frederick B. Adams, Jr., to director, Vanadium Corp. of America.

W. N. Hall, to president, Dominion Tar & Chemical Co. Ltd. (Montreal, Can.).

George F. Kirby, Jr., to director, Ethyl Corp.

H. K. Vanderhoef, to vice-president in charge of sales, Kay-Fries Chemicals (New York).

David L. Rawls, to director of sales, Dixon Chemical & Research (Newark, N.J.).

Earle S. Ebers, to assistant general manager, Naugatuck Chemical Division, U.S. Rubber Co.

Lawrence J. Serkanic, to chief of the protective coatings laboratory, Nuodex Products Co., division of Heyden Newport Chemical Corp. (New York).

Charles C. Yent, to manager of manufacturing, Diamond Black Leaf Co. (Cleveland).

Austin H. Kutscher, to associate medical director, Medical Division, E. R. Squibb & Sons, a division of Olin Mathieson Chemical Corp.

PRODUCT NEWS FROM Pfizer

L-LYSINE

(monohydrochloride)

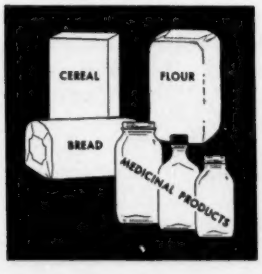
with NO D-isomer

produced by fermentation... now available in quantity

• Through its leadership in fermentation chemistry, Pfizer now offers pharmaceutical and food manufacturers the essential nutrient L-lysine in practical commercial quantities. A unique fermentation process assures that only the biologically active L-isomer is produced.

In the average human diet lysine is more deficient than any of the other eight essential amino acids.

Volume production of Pfizer L-lysine means you can offer an important new health plus in your products. In medicinal products Pfizer L-lysine should have special significance in meeting the nutritional needs of children, pregnant women, older people and those who are recovering from illness. In cereal food products, particularly wheat products,* Pfizer L-lysine can improve the amino acid balance to a level comparable to that of high quality animal proteins.



Write us if you would like further information about Pfizer L-lysine, and a free sample. Pfizer Technical Service men can also help you in taking advantage of this important new development.

*Before adding L-lysine to food products, manufacturers should check Federal and State standards of identity.

Manufacturing Chemists for over 100 years.

Pfizer

CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas

Corrosioneering News

Quick facts about services and equipment available to help you reduce corrosion and processing costs.

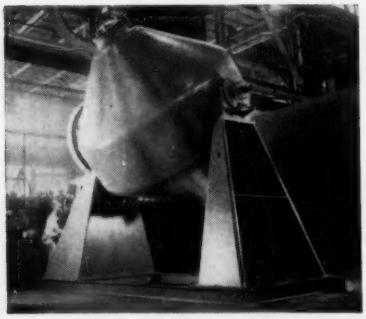
I.D. up, are provided as required. The standard manhole is in the shell at the top of horizontal tanks and in top head of verticals. Both are 12″ x 16″. The manhole cover is flat and glassed on the inside.

You can drastically reduce your storage costs with these dependable Pfaudler "Chemstors" because of: (1) low initial cost, (2) greater product protection, (3) easier cleaning. Bulletin 918 gives you all the facts.

Amazing test results with glassed steel dryer-blender

On test at one of the nation's leading pharmaceutical companies recently, the new Pfaudler glassed steel blender (patents applied for) came through with flying colors on several organic products.

The most difficult test, which was done first, involved a material



One of the biggest so far — 255 cu. ft. When fully charged, this giant blender weighs approximately 20,000 lbs. The heavy-duty gear drive tumbles bucket at 8 RPM with a 15 HP motor. Unit is provided with a magnetic brake, giving you instant and positive control.

with the consistency of whipped cream. Results were amazing and *proved that one Pfaudler dryer-blender could be used to dry seven to ten different products, replacing three conventional tray dryers of 100 trays each!*

The manufacturer immediately placed an order for a six-foot dryer-blender on the spot. Results like these speak for themselves.

You get more than just a dryer with any Pfaudler unit—you get a dryer-blender which gives you these important advantages: high heat transfer, lower power requirements, corrosion resistance, uniform drying and blending. You are invited to test your products in our laboratory test blender at any time, sending your own men along to observe results, if desired. Or, if preferred, Pfaudler will arrange to send a field unit to your plant. Just contact your nearest Pfaudler office or write direct.

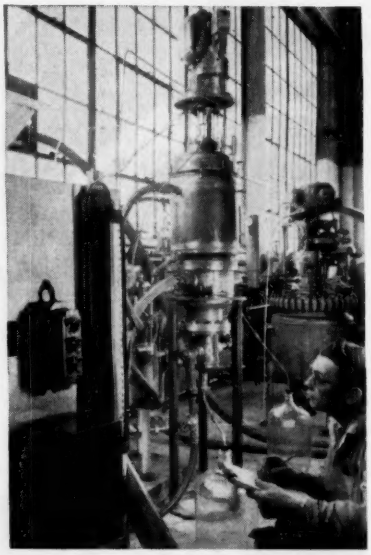
Purer distillates from new Pfaudler wiped-film evaporator

Pilot plant test unit now available

A substantial number of two-inch Pfaudler laboratory-type wiped-film evaporators are already in use on products ranging from volatile solvents to heavy oils and fats. Results to date indicate high efficiency in obtaining pure distillates. Product quality has been particularly improved on such counts as clarity, odor and color.

Send for questionnaire

To help you further evaluate the advantages of high-vacuum distillation for your products on a pilot plant scale, Pfaudler has equipped its testing laboratory at Rochester



Ready to test your products—Now you can check all the advantages of vacuum distillation before investing in equipment. Product purity, faster production and increased profit are among the advantages you may gain.

with the 12″ unit shown above. Please write for a copy of our data questionnaires – forms number 23 and 24. It is, of course, essential for us to know what the physical and chemical properties are in order to determine the feasibility of testing your material.

You can obtain the questionnaire by using the coupon below. Information on the equipment itself is contained in Data Sheet 39, also available on request.

THE PFAUDLER CO., DEPT. CW-3, ROCHESTER 3, N.Y.

Please send me the following: ☐ Wiped-Film Evaporator Questionnaires — 23 and 24 ☐ Wiped-Film Data Sheet 39 ☐ Chemstor Tanks, Bulletin 918 ☐ Dryer-Blender Data Sheet 26 ☐ Stainless Steel Equipment, Bulletin 944.

Name.....

Title.....

Company.....

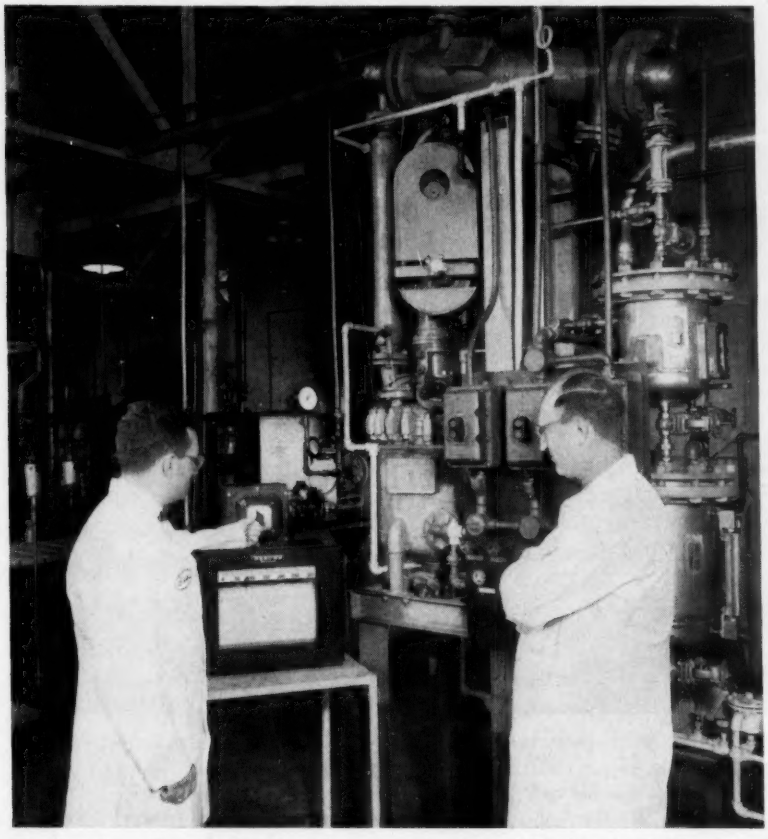
Address.....

City..... Zone..... State.....

EXTRA FAST DELIVERY
of *standard* Pfaudler stainless steel reactors now!

Pfaudler

Pfaudler Corrosioneering News Published by The Pfaudler Co., Rochester, N.Y.



Pilot Plant Spans Pharmaceutical Operations—Almost any operation in pharmaceutical manufacture can be performed in this new 4 x 9 x 2½-ft. pilot plant unit designed for Lakeside Laboratories, Milwaukee, by Pfaudler. It can reflux, react, distill and handle quickly a host of functions. High-vacuum distillation is done at as low as 50 microns Hg absolute pressure.

Unusual pilot plant assembly steps up Lakeside's synthetic work

"Virtually all pilot plant operations in pharmaceutical chemistry can be performed in a single new compact assembly specially designed for Lakeside Laboratories, Inc.," states Joseph N. Jacques, plant engineer.

The assembly, part of the expanding synthetic chemistry division, was made to Lakeside specifications by Pfaudler. It requires a floor space of only 4 feet by 9 feet by 30 inches.

It can reflux, react, distill and handle quickly a host of physical and chemical functions. The new unit is particularly noteworthy because high vacuum distillations are achieved at as low as 50 microns Hg absolute pressure.

Made entirely of Type 316 stainless steel, it will handle most of the organics used in Lakeside's products. It is presently used for distilling N-Ethyl-3-Hydroxypiperidine.

All of the initial synthetic work is concentrated on the production of antispasmodics, produced under the trade names of "Dactil," "Piptal," and "Cantil." The staff has found the equipment fast, versatile and easy to manipulate, Mr. Jacques said. The unit can be used for small-scale pilot plant operations as well as full-scale production.

New low-cost corrosion-resistant "Chemstors" get wide usage

Since the introduction of the low-cost Pfaudler glassed steel "Chemstor," companies in various industries have found it the answer for storing corrosive liquids.

A quick analysis of usage reveals successful handling of such products as chlorine dioxide, chlorosulphonic acid, polyvinyls, hydrochloric, nitric, and sulphuric acids in various concentrations, distilled and potable water and a host of inorganics which were not specified. Pfaudler glass prevents product contamination and assures easy cleaning.

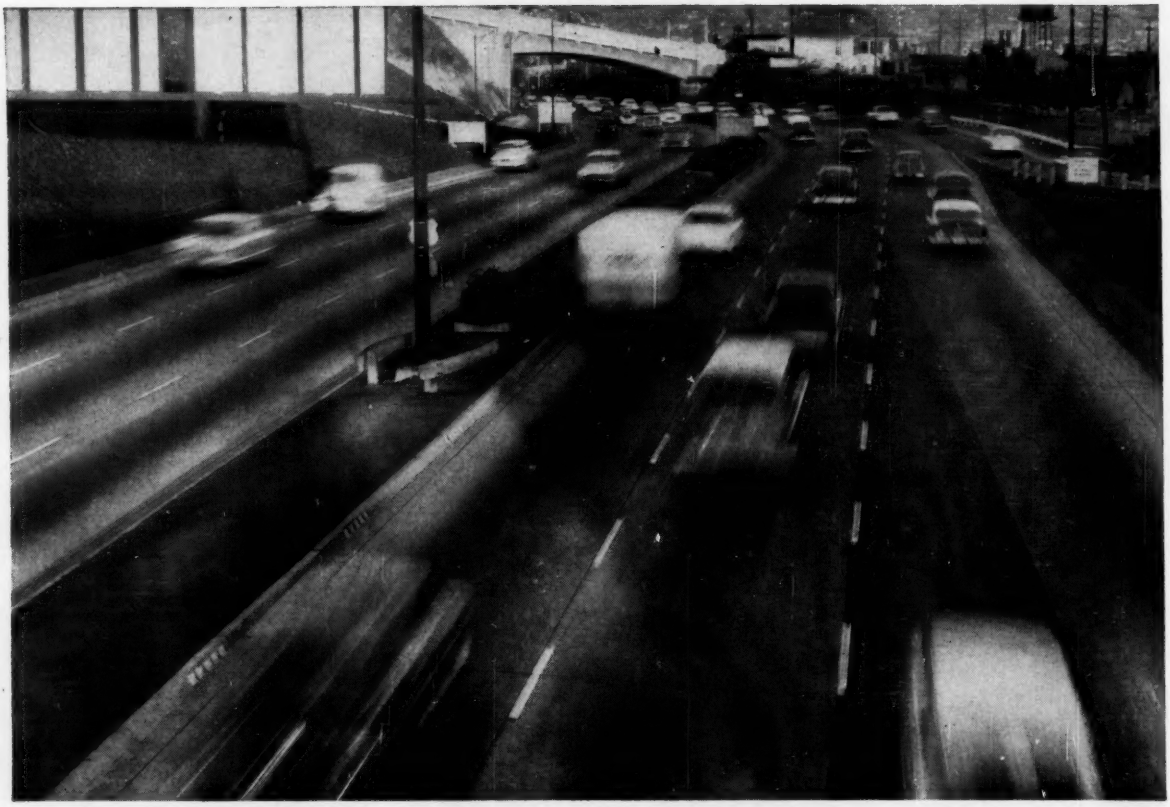
"Chemstors" are available in both horizontal and vertical design. Sizes range from 750 to 35,000 gallons and *cost as low as 25¢ per gallon*, depending, of course, on size and service requirements.

Flanged nozzles, in sizes from 3″



Beginning of "Chemstor" tank farm. The more of these low-cost glassed steel storage tanks you use, the greater your product protection and ease of cleaning.

HOW HERCULES HELPS...



IMPROVE HIGHWAY SAFETY—Markings on this heavily traveled Pasadena, Calif. freeway are clearly visible after three years of 120,000 vehicle per day traffic. That's because the traffic paint is fortified with Parlon® chlorinated rubber. Parlon is specified by state, county, and city engineers from coast to coast because of its long wear, rapid dry, excellent adhesion, and lower long-term cost. This story is dramatized in the new Hercules movie "Highway Life Lines". To see it, contact your local Hercules representative or write for more information.



DIVERSIFY ITS SERVICE—With the acquisition of Huron Milling Company, now a division of the Virginia Cellulose Department, Hercules adds an entirely new range of products to the company's industrial chemicals. Huron products, made from wheat flour, are used in foods, adhesives, and in both edible and non-edible starches. The Huron plant is located at Harbor Beach, Michigan, along the shore of Lake Huron.



G57-3

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CHEMICAL MATERIALS FOR INDUSTRY

A Progress Report on Faculty Salaries:

UP...But Not Nearly Enough

THE CHART on this page provides a report of the progress being made in solving a problem of crucial importance to every American. The problem is that of seeing that college and university faculty members get decent salaries.

This new chapter, which brings the story forward two years—from 1954, when it was last dealt with in this series of editorials, through 1956—has a decidedly cheering element. For in the last two years faculty salaries have made real headway.

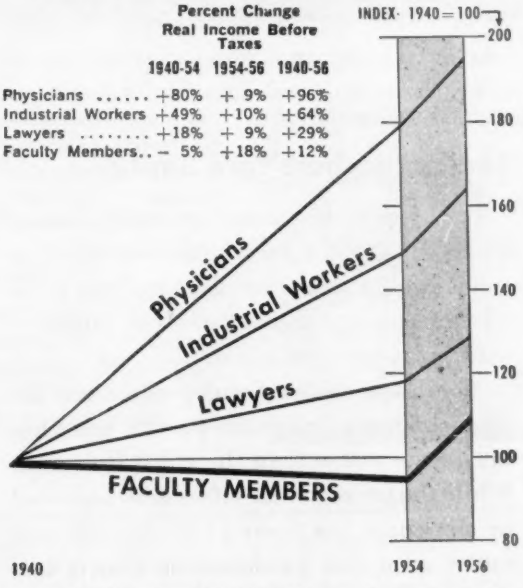
Two Years of Improvement

In 1954, in terms of what their salaries would buy, faculty members as a whole were actually worse off, by 5%, than they had been fourteen years earlier. As the chart shows, over the same period the real income of the average industrial worker had increased by almost half. And, in what it would buy, the income of the average physician, with professional training comparable to that of the average faculty member, had jumped by 80%.

In 1956, however, the average faculty salary would buy about 12% more of goods and services than it would in 1940. Relative to where they were two years before, faculty salaries showed a larger gain over the two years than those of any of the other groups whose salary progress is charted.

This movement of faculty salaries in the right direction has many contributing causes. The biggest single boost was given by the great Ford Foundation gift of half a billion dollars to our colleges, universities, and hospitals, almost half of which was ear-marked for faculty salary increases. Gifts from business firms have also

What is Happening to College Faculty Salaries



DATA: Council for Financial Aid to Education, U. S. Dept. of Commerce, U. S. Dept. of Labor, National Association of Education Research Dept., McGraw-Hill Dept. of Economics.

helped a lot. And so, in many cases, have stepped-up money-raising campaigns by alumni groups and cooperative regional and state groups of colleges.

Still a Long Way to Go

However, faculty salaries started their ascent from such a dismal depth that they still have a long, long way to go up before there is room for the comfortable conviction that they are fair, or even safe, from the standpoint of protecting the nation's vital interests. It still remains possible to find many shocking companion pieces for the following incident recently reported to a McGraw-Hill executive group, working on problems of financial aid to higher education, by the president of an illustrious small liberal arts college.

"The recruiting officer of one of our large industrial companies came to our campus a few weeks ago," the college president said, "and offered five of our seniors higher salaries to start working for that company when they are graduated next June than the salary received by any member of our faculty. And the seniors, of course, promptly went to their professors to seek advice on whether or not they should accept. It doesn't take much imagination to see what this sort of thing does to the morale of a faculty."

Senior Teachers Fare Badly

One of the more devastating things it does, of course, is to make the more experienced college and university faculty members receptive to the idea of going to greener pastures, currency-wise, in business and industry.

For these senior faculty members the financial pounding in the past 16 years has been even worse than the chart indicates. While the average real salary gain reported by the chart has been 12%, the average salary of a full professor still buys less than it did in 1940. This is because most of the salary increases have gone to beginning instructors, for whose services industry has been providing the sort of competition reported by the liberal arts college president.

And it creates this financial lackluster of posts as senior college faculty members right at the time their services are needed more than ever to handle the oncoming flood of college and university students. Between now and 1970 college and university enrollment is expected to double.

What is Needed Now

What is clearly needed is a continuation and intensification of the drive to increase their salaries to a point where college and university faculty members will be sharing somewhere near fully in the general prosperity of the nation. It could be counted good progress in this direction if over the next two years faculty salaries on the average were to go up another 12%, with most of the increase concentrated in the senior faculty ranks. And this can be made possible only through more outside contributions.

There is reason to be encouraged by the progress that has been made over the past two years in bailing college and university faculty members out of the terrible financial hole into which they were allowed to slide. But there is the most urgent occasion to keep at it and harder.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

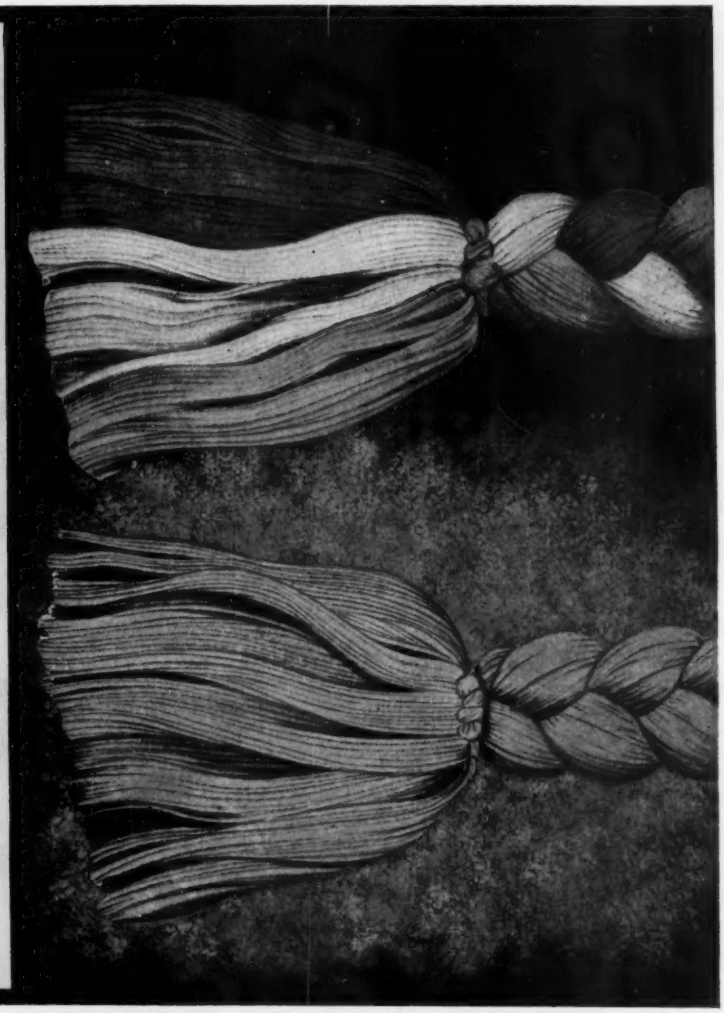
PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

EACH NOPCO CHEMICAL MAKES A PROBLEM OBSOLETE!

No "uninvited" colors

WITH THIS NOPCO SURFACE ACTIVE AGENT



Sometimes textile dyes are unpredictable. When a skein of wool or cotton shows up with unwelcome streaks, many dyers' remedy is the costly one of bleaching or stripping out part of the color, then re-dyeing.

But with a Nopco surface active agent that controls dye absorption, dyers get the *exact* shade they want—every time.

We've mentioned this example merely to show that Nopco research springs directly from practical needs. Other Nopco processing chemicals have achieved economies in many fields—from dispersing pitch particles to help make finer paper, to extending die life in wet-drawing wire, to reducing breakage waste for plastics molders by giving smooth release from the molds.

Whatever *your* most urgent production headache, give the Nopco chemists a chance to help. For quick action, write Nopco Chemical Company, Technical Research Department, Harrison, N. J.

NOPCO

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Nopco Processing Chemicals include: Esters, Ethylene Oxide Condensates, Amides, Metallic Soaps, Sulphonates, Water Soluble Polymers, Resin and Wax Emulsions, Foamed Plastics

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Chemical credit men gather, put . . .



Accent on the Positive

. . **How can chemical credit** management make its most effective contribution to increasing sales and improving the general corporate welfare? At the recent fourth annual meeting of the National Chemical Credit Assn., J. Allen Walker, general credit manager for Standard Oil of California, issued an answer that's sure to win wide support among sales staffers. Walker's position: credit men must adopt a philosophy that accents the "positive."

For the some 120 attenders, there were also several workshop studies and a forecast of how the future credit manager will function.

Walker's blueprint for a positive credit philosophy:

Policy. Management should furnish its credit department with a clearly defined policy. Too many firms, says Walker, still have an inadequate policy or none at all. The code can, for example, set credit objectives from the sales, financial and customer viewpoints and the criteria for extending credit. "An effective policy," he states, "will strike a positive note . . . be a blueprint for action . . . provide latitude for planning."

Terminology. The best credit policies lose effectiveness if described in "negative" phrases. Terminology such as "dunning, cash-on-the-barrelhead, rejected, limit, and problem" are often coverups for negative thinking, Walker believes. He contends that it's far more productive to think of "line" of credit instead of "limit," percent of applications "approved" rather than percent "rejected." And creative thinking, he declares, has turned many a credit "problem" into a sales "opportunity."

Human relations. "Credit to the customer is a very personal thing," says Walker. Although the actual credit decision is important, the means of telling the customer the decision is equally important. Conversion of a delicate situation into an advantageous relationship demands "creativity and empathy." The positive approach can build lasting friendship and profitable credit sales. When made a philosophy, adds Walker, such an outlook will expand sales, boost customer relations, afford better use of capital and, ultimately, improve profits.

Peek Ahead: Credit Research Foundation's William Dickson, drawing upon his experience as CRF's managing director, portrayed future credit management. The credit manager of the future, predicts Dickson, will:

- Be more of a "general management" man than he is now. Already, claims Dickson, more companies consider business credit operations "important enough to warrant—as a chief operating executive—a management man with responsibility for the credit function rather than a specialist with perhaps some other duties."
- Be more proficient in the use of specialized knowledge, experience, job techniques, other management tools.
- Have an enhanced ability to view the company as a whole and how changes in one area will affect the entire enterprise. He will make "company" decisions rather than "credit department" decisions, have a "broad viewpoint."
- Have a greater realization that administration is mainly "getting the job done through other people."
- Spend more time on selection,

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UNIFORMITY of chemical-physical specifications
AVAILABILITY in tonnage
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In physical form, you will find Baker Lead Nitrate and Lead Acetate convenient to use. Chemical purity is closely controlled. Availability is scheduled to your production needs. All these factors are of particular importance in the transition of new or experimental processes in large scale manufacturing. Check specifications below.

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Assay ($Pb(NO_3)_2$)	99.0 %
Insoluble Matter	0.010%
pH of 20% Solution at 25°C.	3.0-4.0
Substances not precipitated by H_2S (as SO_4)	0.30 %

Color—White

LEAD ACETATE,
Technical
Crystal
Small Crystal
Granular 4-20 Mesh
Powder

$Pb(C_2H_3O_2)_2.3H_2O$ — F. W. 379.35

Assay ($Pb(C_2H_3O_2)_2.3H_2O$)	99.0-105.0%
Insoluble Matter	0.020 %
pH of 5% Solution at 25°C.	5.5-6.5
Substances not precipitated by H_2S (as SO_4)	0.20 %

Odor: Faint Acetic Acid
Colorless and free flowing

Crystal—Size:
3" and finer

Granular 4-20 Mesh:
Max. 15% On U.S. No. 4 Sieve
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Bulk (untapped): 50 Gm 35-42 ml.

Small Crystal—Mesh:
Max. 25% On U.S. No. 4 Sieve
Min. 75% On U. S. No. 40 Sieve
Max. 20% Thru U.S. No. 140 Sieve

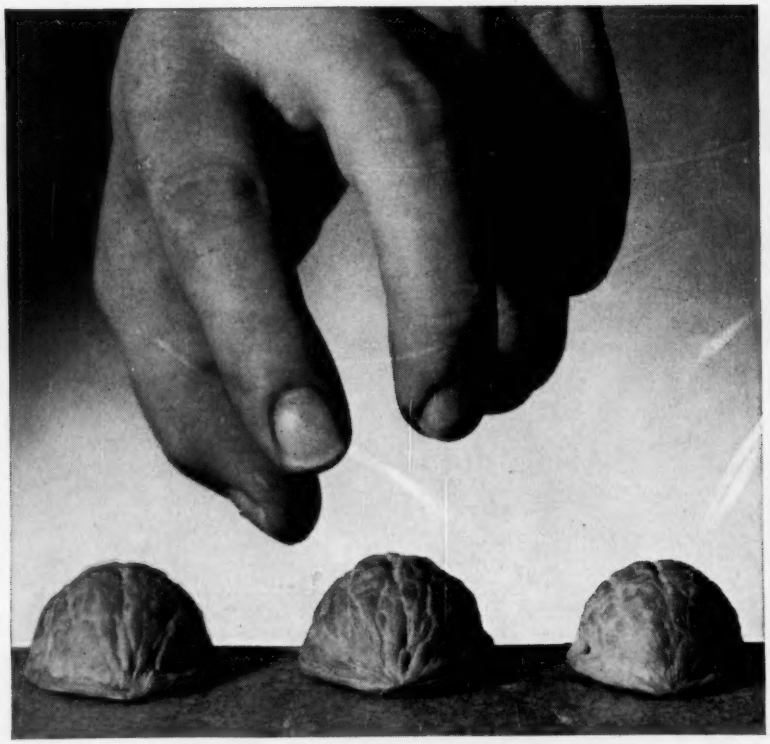
Powder—Mesh:
Max. 1% On U.S. No. 20 Sieve
Min. 85% Thru U.S. No. 40 Sieve
Bulk (untapped): 50 Gm 39-56 ml.

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Phillipsburg, New Jersey

training and evaluation of credit personnel, customer counseling and company policy.

The future credit manager, however, won't develop of his own accord. The change can stem only from individual, personal appraisal, planning and improvement. Will it warrant the effort? Yes, Continental Can's Vice-President Charles Stauffacher told the meeting. The well-informed credit manager will increasingly become a key source of top management.



Pick carefully . . .
pick PURECAL!

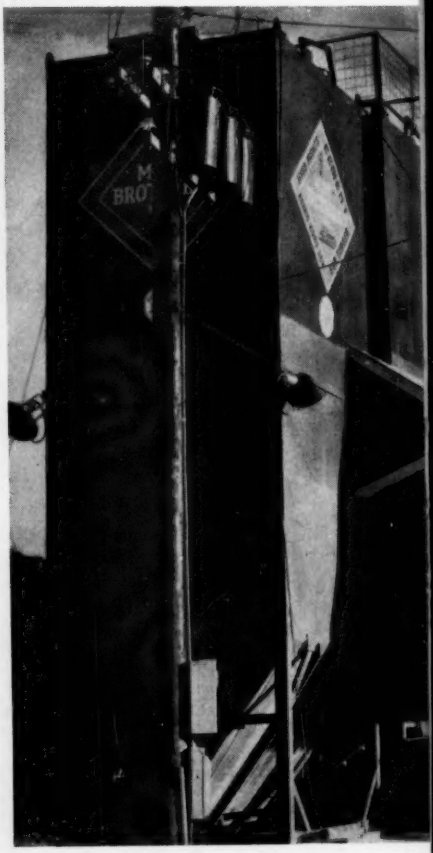
Three samples of calcium carbonate are laid on your desk: one produced from finely ground limestone, the second from precipitation by carbonation of a milk of lime suspension, and the third precipitated by the reaction of clear solutions of calcium chloride and sodium carbonate. Which would you select? Very likely the last one, for it is pure and bright, without silica and abrasives. And it is this outstanding purity of product that you get when you choose Wyandotte PURECAL*.

Wyandotte PURECAL ($CaCO_3$) comes in various grades – many developed specially for particular industries. It finds extensive use in papermaking, paints, plastics, dentifrices, food products, cosmetics – and many other industries . . . the PURECALS improve rubber products, reducing costs, and increasing tensile strength and tear resistance.

If you have need for a product like PURECAL, send us as much information as you can on your requirements, and we'll forward PURECAL samples and technical data. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.* *Reg. U.S. Pat. Off.

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Stand-By Storage

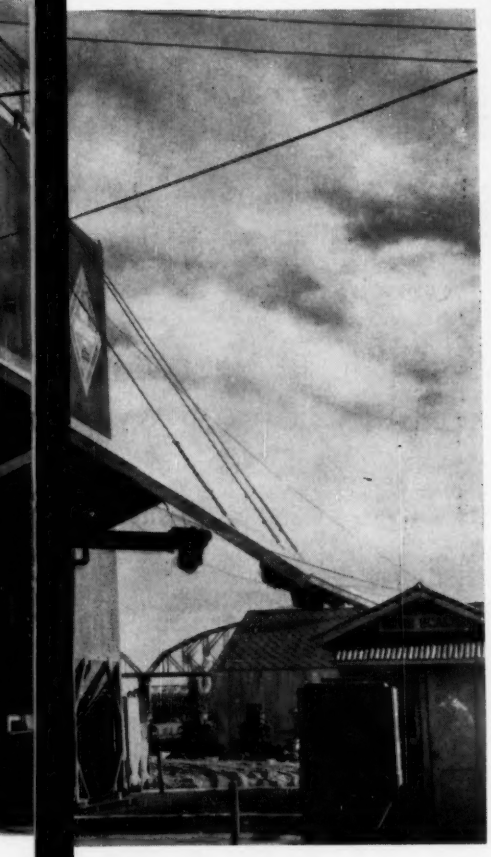
Although 36 ft. tall and capable of holding 7,500 cu. ft. of granular material, this new bulk storage assembly is portable. Fastening of detachable wheels and an axle permits the units to be towed by a conventional truck tractor. Developed by Delta Tank Mfg. Co., Inc. (Baton Rouge, La.), the equipment consists of a "main chamber" containing an upper and lower

Moving into Metric

Canada is inching closer to adopting the metric system for pharmaceutical packaging.

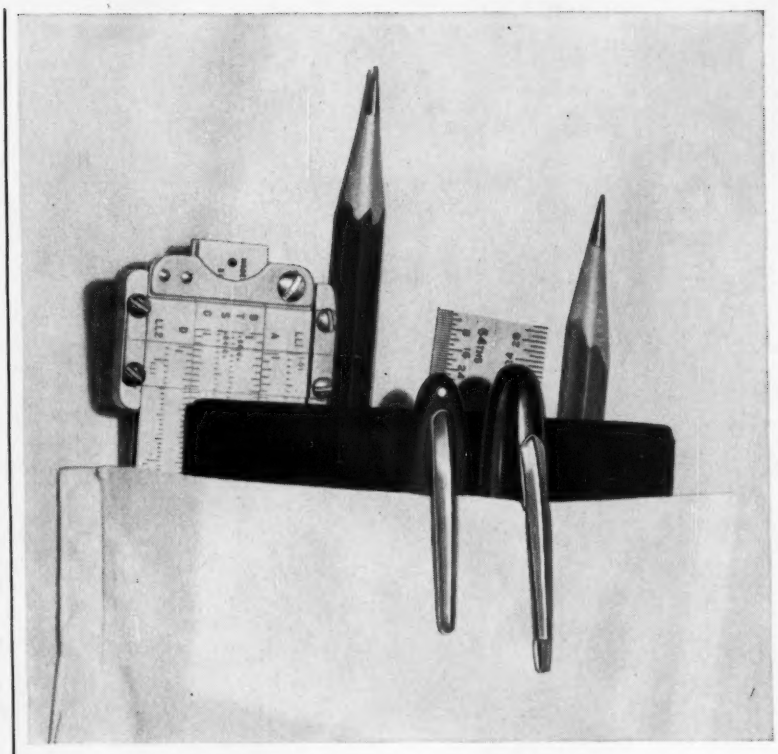
The head of the Food and Drug Directorate, C. A. Morell, has notified all drug manufacturers, distributors and pharmacists that the continued use of two distinct systems for drug dosage may be a hazard to public health.

Urging continued efforts for a



ge Adds Mobility

storage section. The upper part is fed by bucket-type elevators, drawing material from the bottom. Capacity can be increased by use of 2,500-cu.-ft. bins connected to the central 2,500-cu.-ft. unit by air slides. The assembly can unload a full hopper railroad car of cement, barite or other mineral in 2 hours, charge trucks at the rate of 20 cu. ft./second.



Need technical help?
Drop us a line

Although we are primarily concerned with converting limestone, salt, coal, and petroleum derivatives into basic chemicals of highest commercial purity, one of our major enterprises is helping customers use our products to the best advantage.

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Whether you are a Wyandotte customer, or a prospective customer, our complete facilities are at your disposal. If you have a product or processing problem, send us as many details as possible. We'll be happy to lend assistance in every way we can. *Wyandotte Chemicals Corp., Technical Inquiry Section, Wyandotte, Mich. Offices in principal cities.*

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HEADQUARTERS FOR ALKALIES



...enough Elbow Room

Everybody benefits when highway location allows adequate space for new industrial development between railroads and public roads. The highway is a major artery, usually difficult or impossible to cross with spur trackage.

The *right kind* of planning by community and highway authorities makes *sure* that: (1) Areas with reasonable prospect of industrial development are protected by modern zoning. (2) Highway authorities plan new construction at *sufficient distance* from rail lines—*200 to 1,000 yards is realistic.*

Orderly construction of grade separations and needed approaches is possible when industrial zoning and highway planning go hand in hand. Then, properties between highway and railroad become more valuable as potential plant sites, and are *assured* the best choice of efficient transportation. The community benefits by NEW jobs and NEW sources of tax revenue—and *every citizen* benefits!

SPECIAL STUDY
"Look where a site is production-right"
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B&O RAILROAD
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B&O'S PLANT SITE MEN ARE LOCATED AT:
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changeover, Morell called attention to amended regulations stipulating that "accurate dosages may be expressed in either metric units or imperial units."

The directorate now offers a table (*excerpts below*) for use in converting imperial units into metric equivalents. Morell claims that use of the table has industry support. Canada's FDD, however, makes these recommendations on conversion:

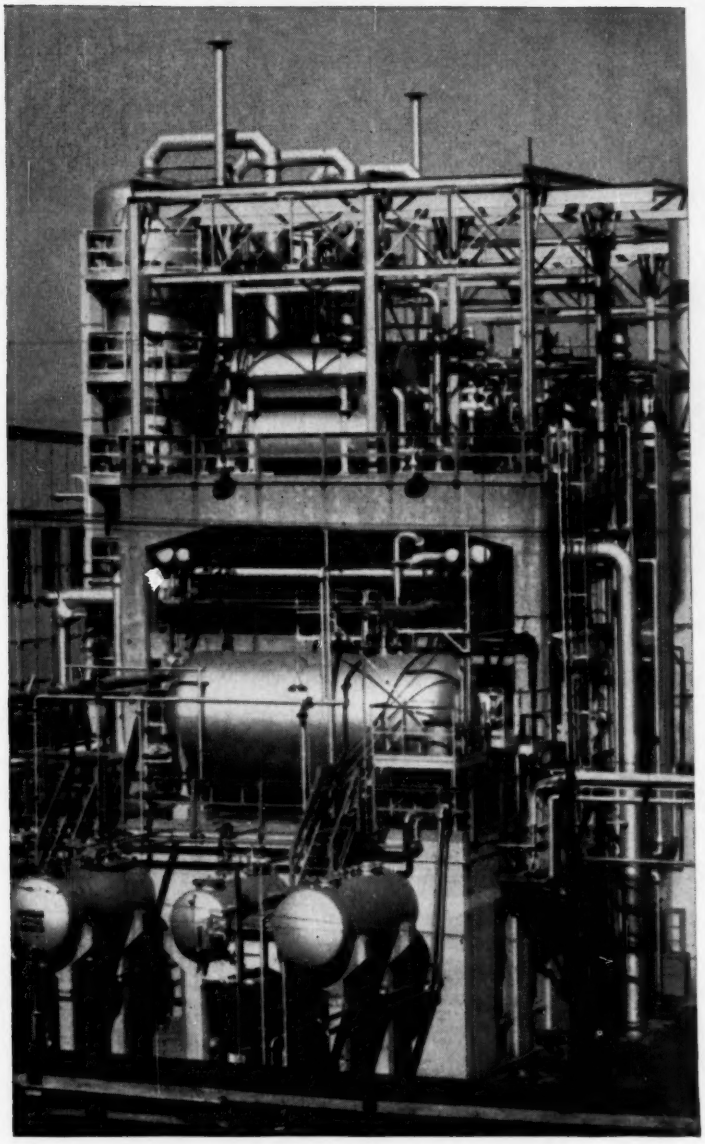
- If the products are formulated and labeled in the metric system, there should be no necessity to add an approximation of measures in the imperial system.
- If drugs are formulated and labeled in the imperial system, a metric approximation—as contained in the table—shou'd precede or follow the imperial units in brackets.
- Manufacturers adopting the metric system as a primary standard should not make the change until they're ready to reformulate and manufacture in metric-size quantities (i.e., producers should not simply label a 5-grain tablet 324 milligrams; rather they should introduce a new, 300-mg. tablet). FDD hopes that odd-size tablets will be nonexistant after the switchover.

Morell believes that the conversion will "take a number of years, and must be done gradually. It would be a mistake to convert measures into metric units (except by addition of approximate values) at this time without reformulation to round numbers." The directorate, added Morell, stands ready to help manufacturers, distributors and pharmacists with any conversion problems.

Canadian food and drug directorate's recommended metric-imperial equivalents

Imperial Unit	Approximate metric value
DRY MEASURE	
1 ounce	30 grams
90 grains	6 grams
⅛ grain	12 milligrams
1 grain	60 milligrams
LIQUID MEASURE	
2.5 fluid ounces	75 milliliters
1.0 fluid ounces	30 milliliters
90 minims	6 milliliters
1 minim	0.06 milliliters

Goodrich-Gulf Chemicals, Inc.



Processing efficiency and quality control receive the closest attention at Goodrich-Gulf plants. The result is a preference for Ameripol by users of man-made rubber.

more capacity for *Ameripol* man-made rubber

CONTINUING modernization of our giant Institute, W. Va. plant increases output . . . complements facilities at Port Neches, Texas. Result —more Ameripol man-made rubber, faster service for you.

Ameripol is the preferred rubber for tires and floor tile, for scores of industrial products such as belts, brake cups, extrusions. It's noted for quality and uniformity that simplifies your processing.

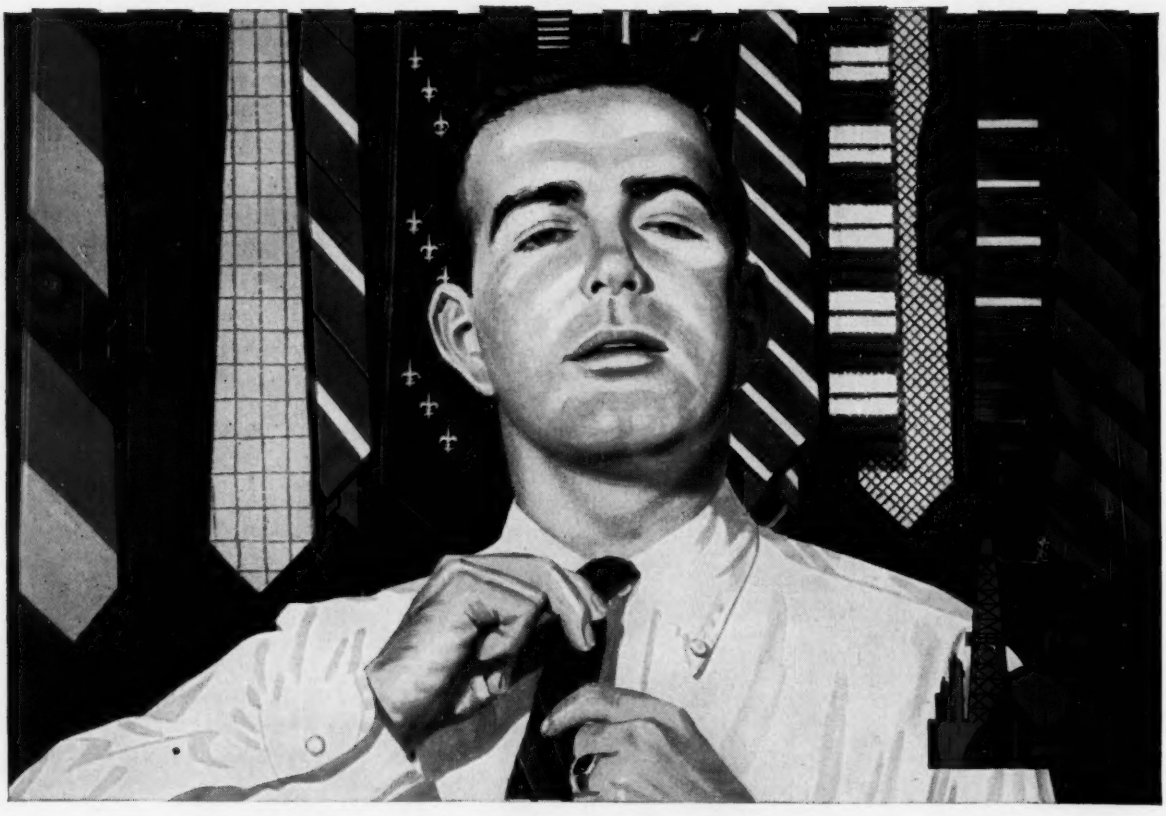
Warehouse service from Chicago, Akron, and Port Newark, N. J., teams with direct plant shipments to provide outstanding service on all orders —large or small. Call us for your requirements.

Goodrich-Gulf Chemicals, Inc.
3121 Euclid Avenue Cleveland 15, Ohio

Ameripol RUBBER

Cold Non-Oil Polymers
•
Cold Oil-Extended Polymers
•
Hot Non-Oil Polymers

THE NAME TO REMEMBER FOR QUALITY BACKED BY YEARS OF RESEARCH AND EXPERIENCE



More Colorful, More Profitable–
Thanks to Atlantic Ultrawets

Color—just the right color—often makes all the difference between clothing that *sells* and clothing that stays on the sales counter. These handsome ties are more colorful, and more profitable, because the dyes have penetrated easily and evenly.

That's where Atlantic Ultrawets come into the picture. With Ultrawets in the dye bath, the fibers drink up the dye with all its intense color and sales appeal. The Ultrawets are members of the fast-growing family of petrochemicals made by The Atlantic Refining Company—so you see the miniature refinery along with the ties.

Today, capable, versatile Ultrawets are important in formulations for scores of uses, from industrial wetting agents to household detergents. And industry is constantly finding profitable new uses—in new products, in cost-saving manufacturing advantages, in adding new sales appeal to well-established products.

Atlantic sales engineers are always ready to help your staff get the most from your use of Atlantic petrochemicals. For full information, write The Atlantic Refining Company, Dept. H-3, 260 South Broad Street, Philadelphia 1, Pennsylvania.

ATLANTIC PETROLEUM CHEMICALS

PHILADELPHIA
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CHARLOTTE
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In the West: L. H. Butcher Co.

In Canada: Naugatuck Chemicals Division of Dominion Rubber Company, Ltd.

In Europe: Atlantic Chemicals SAB, Antwerp, Belgium

In South America: Atlantic Refining Company of Brazil, Rio de Janeiro

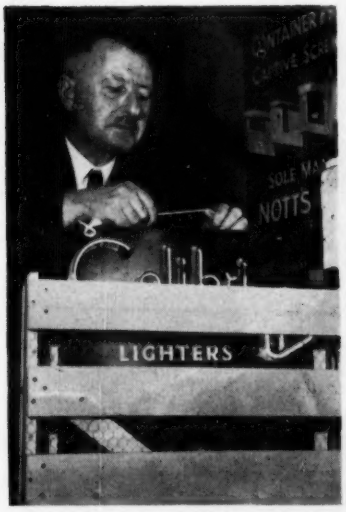
DATA DIGEST

• **Catalog:** Publication lists more than 4,000 chemicals including fine organics, reagents, indicators and certified biological stains. Matheson, Coleman and Bell Co. (East Rutherford, N.J.).

• **Export statistics:** Booklet describes proposals by the U.S. Dept. of Commerce's Census Bureau to reduce the number of separate classifications used in compiling and publishing export statistics. Bureau of the Census, U.S. Dept. of Commerce (Washington, D.C.).

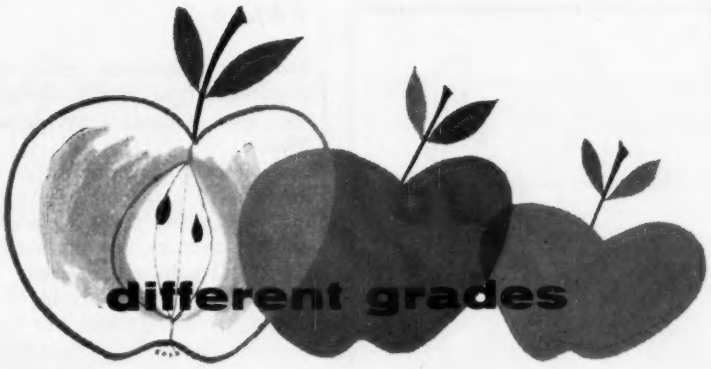
• **Forest fertilization:** Results of Japanese forest fertilization experiments are explained in a 35-p. booklet. The figures indicate that pulpwood growing time can be reduced up to 20%. Application and cost data are included. Nitrogen Division, Allied Chemical & Dye Corp. (New York).

• **Silicone fluids:** 4-p. folder describes company's line of silicone fluids



Let It Show

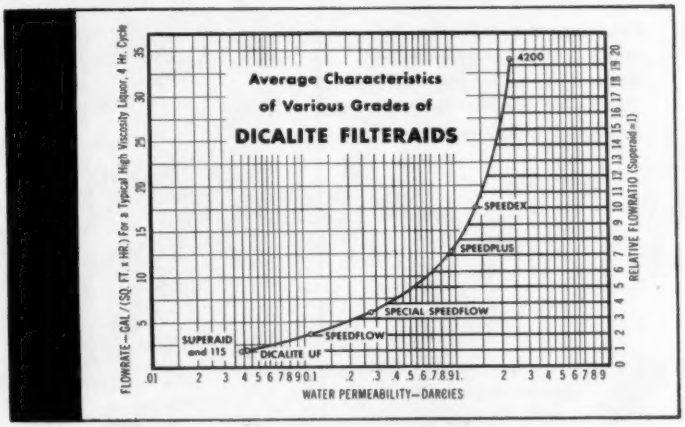
Packaging of glass goods so that handlers may see that they are fragile is one precaution against breakage in transit. It's a technique that may profitably be adapted by some chemical shippers. T. F. Dingwall Ltd. (London) recently exhibited this "open" method of packaging neon signs (*above*), contends that longshoremen and porters are thereby influenced to handle these products more gently.



...but just one quality!

Filteraids and certain kinds of fruit have this one thing in common — that *grade* is a matter of size, and has no reference to quality. The smaller fruit may be the equal of the larger in everything but size.

Filteraid quality means the highest possible degree of clarification for the grade employed, at greatest throughput per quantity of filteraid. Dicalite achieves this high quality—in every grade—by (1) careful selection of the crude diatomite from Dicalite's four high-grade deposits; (2) processing with the industry's most modern equipment, and (3) the industry's most rigid quality control system, which assures the same carefully controlled particle size range and distribution for each grade, uniformly, dependably, lot after lot. Which may explain why so many leading firms in every branch of processing have standardized on Dicalite Filteraids.



DICALITE HAS SEVEN GRADES OF FILTERAIDS
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dicalite division, great lakes carbon corporation 612 south flower st., los angeles, california

and their applications, gives table of physical, thermal and chemical properties. Dow Corning Corp. (Midland, Mich.).

• **Silicones:** Use of silicone products in adhesives, antifoaming agents, cosmetics, damping fluids, electrical insulation, ceramics, heat transfer fluids, lubricants, polishes, protective coatings, release agents, textile finishes, masonry water repellents and applications of silicone rubbers are outlined in an 8-p. brochure. Silicone Dept., General Electric (Waterford, N.Y.).

• **Resin-rubber compound:** Illustrated bulletin furnishes extrusion information on Kralastic, a resin-rubber material. Plastic pipe extrusion data and a list for "trouble shooting" common problems are included. Naugatuck Chemical Division, U.S. Rubber Co. (Naugatuck, Conn.).

• **Surface-active agent:** Technical bulletin describes properties of Lubrol WX, a nonionic surface-active agent, and preparation of water solutions stable to acids, alkalis, salts and hard water. Arnold, Hoffman & Co., Inc. (Providence, R. I.).

• **Technical service:** 22-p. brochure describes a company system of technical assistance available to users of petroleum products. Gulf Oil Corp. (Pittsburgh).

• **Product directory:** Folder lists types of products manufactured by various company divisions, plant locations, branch sales offices, subsidiary and affiliated companies. Corning Glass Works (Corning, N.Y.).

• **Maintenance material:** Booklet describes products useful for vehicle undercoating, asphalt pavement sealers, roofing compounds, insulation coatings and adhesives, tile cements, waterproofers and other applications. Chemical Division, Borden Co. (New York).

• **Austrian labeling:** Folder gives reference to legislation regulating marking and labeling of acetic acid, cosmetics, foodstuff dyes and nitrites, explosives, feeds, narcotics, baking chemicals, pharmaceuticals, poisons, polishes, soap and many food products in Austria. Also contains summary of key legislation. Operations Reports, Part 2, No. 57-7; 10¢. World Trade Information Service, U.S. Dept. of Commerce (Washington, D. C.).



It's better to get it from Eastman . . .

Sure, when you need an uncommon organic (or an uncommonly pure one) in more-than-test-tube and less-than-tank-car quantities, try Eastman Organic Chemicals Department, *Distillation Products Industries,* Rochester 3, N. Y.

DPi

there are some 3500 Eastman Organic Chemicals for science and industry

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Truck Trailer Loads Itself

By teaming a specially developed conveyor to rigid, removable truck liners, Link-Belt has come up with a new transportation medium—the self-loading truck trailer. It holds promise of finding wide application in trucking chemicals and other products. Cargo is loaded conventionally or through the trailer roof hatches into the truck liner. The conveyor then moves the bulk container directly from the unloading platform into the trailer body. Claimed advantages: minimization of warehouse and materials handling costs, increased handling.

MARKETING?



No. 1 spender proves . . .

The proof of the pudding is in the eating. And junior will prove it the moment this instant pudding cools. Victor disodium phosphate as the buffering agent in prepared puddings gives the creamy, smooth texture that helps make them a best seller. Just another reason why it *pays* to see Victor.



Meet the nation's No. 1 spender—Mrs. Housewife—hard at work proving it pays to see Victor. Almost every item she shops for today is more to her liking, more convenient to use or more healthful because of Victor chemicals.

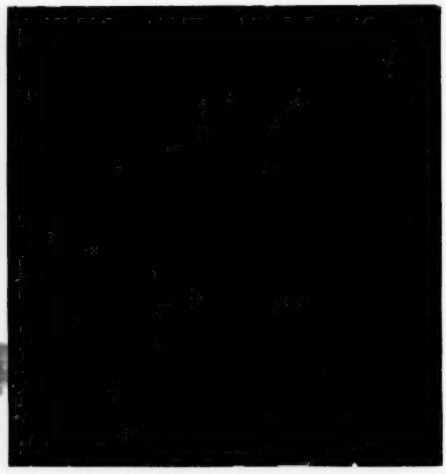
No wonder more than 40 different industries today rely on Victor—for phosphates, formates, and oxalates that help put *new* products on the market . . . push *present* products off self-service shelves and onto check-out counters.

Why not check with Victor if you have a marketing problem, or want to cut production costs? Like so many others, you'll find it *pays* to see Victor.



Bye bye, blues (**washday that is**) Her laundry is light work these days, thanks to heavy-duty detergents and automatic washers. And as soap and detergent manufacturers know, it *pays* to see Victor for sodium tripolyphosphate and tetrasodium pyrophosphate. Both have outstanding water-softening action and detergent qualities.





Bright as a dollar. Victor phosphoric acid, in a special bath, makes aluminum sparkle . . . gives a bright finish to stainless steel, copper, brass, and other metals. Both bright dipping and electrolytic baths give better results in less time and cost less than mechanical buffing. If you're marketing metal products, make a mental note to contact Victor. It *pays*.



We're in the market, too—for chemical engineers, sales engineers, chemists. If you're shopping around, our door is open—and it *pays* to see Victor. For information, write to: Victor Chemical Works, Technical Personnel Division, 155 N. Wacker Drive, Chicago 6, Illinois.

it pays to see Victor



VICTOR

Dependable Home Chemicals

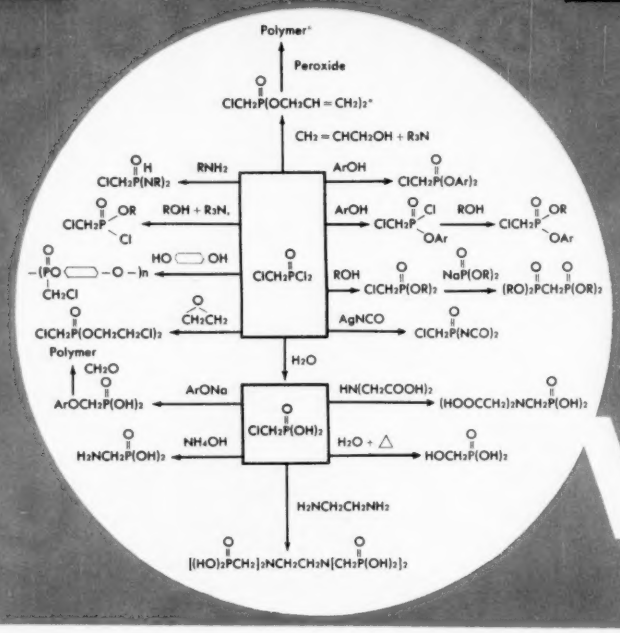
what more can you get out of organophosphorus derivatives?

That's a hard question to answer, for at Victor *some people never let well enough alone.* Some of our best people. too. For example, look what happens to a new intermediate like chloromethylphosphonic dichloride when restless research chemists work on it. A condensation here . . . a hydrolysis there . . . and a whole series of new products results. Some of the ideas our chemists put to work themselves to provide us with a complete line of chloromethylphosphonic compounds.

Perhaps *you* can find other uses for the reactive chlorine atoms, the carbon-to-phosphorus bond, and the stable alpha-chlorine . . . the host of reaction possibilities Victor chloromethylphosphonic compounds present.

If *you're* looking for new ways to improve products, adapt them to new markets, one of these compounds may be just right for you.

Pilot Plant Quantities . . .
Pilot plant quantities of the dichloride, the acid, and the dipropyl, dibutyl, and dioctyl esters are available. Fill in the coupon below for research samples or data.



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Dependable Name in Chemicals for 59 Years

*U. S. Patents 2,714,100 and 2,735,789

VICTOR CHEMICAL WORKS
155 N. Wacker Drive • Chicago 6, Illinois

Please send me ☐ samples ☐ data sheets for the Victor chemicals checked below:

- ☐ Chloromethylphosphonic dichloride
- ☐ Chloromethylphosphonic acid
- ☐ Dipropyl chloromethylphosphonate
- ☐ Dibutyl chloromethylphosphonate
- ☐ Dioctyl chloromethylphosphonate

NAME_____ TITLE_____

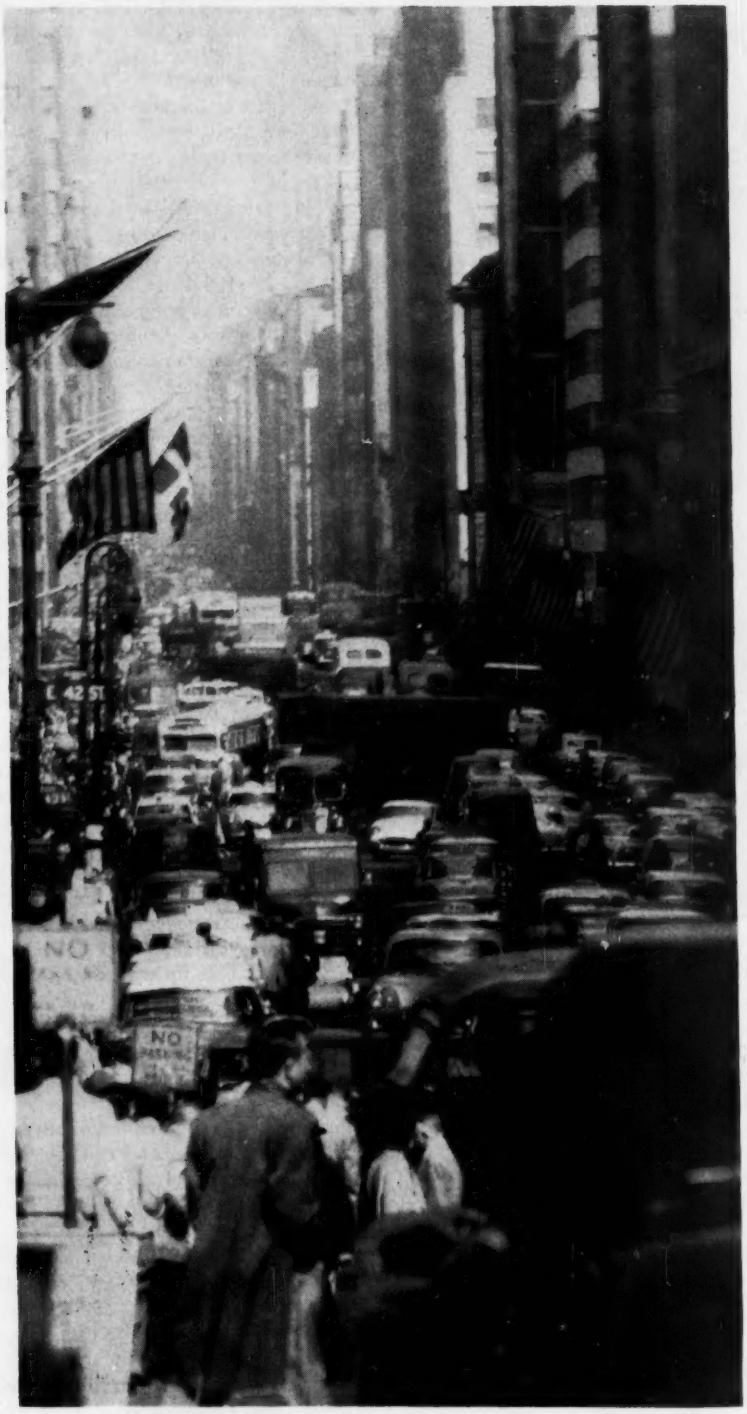
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ADDRESS_____

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target

Brake Linings that Stand Up to Heat



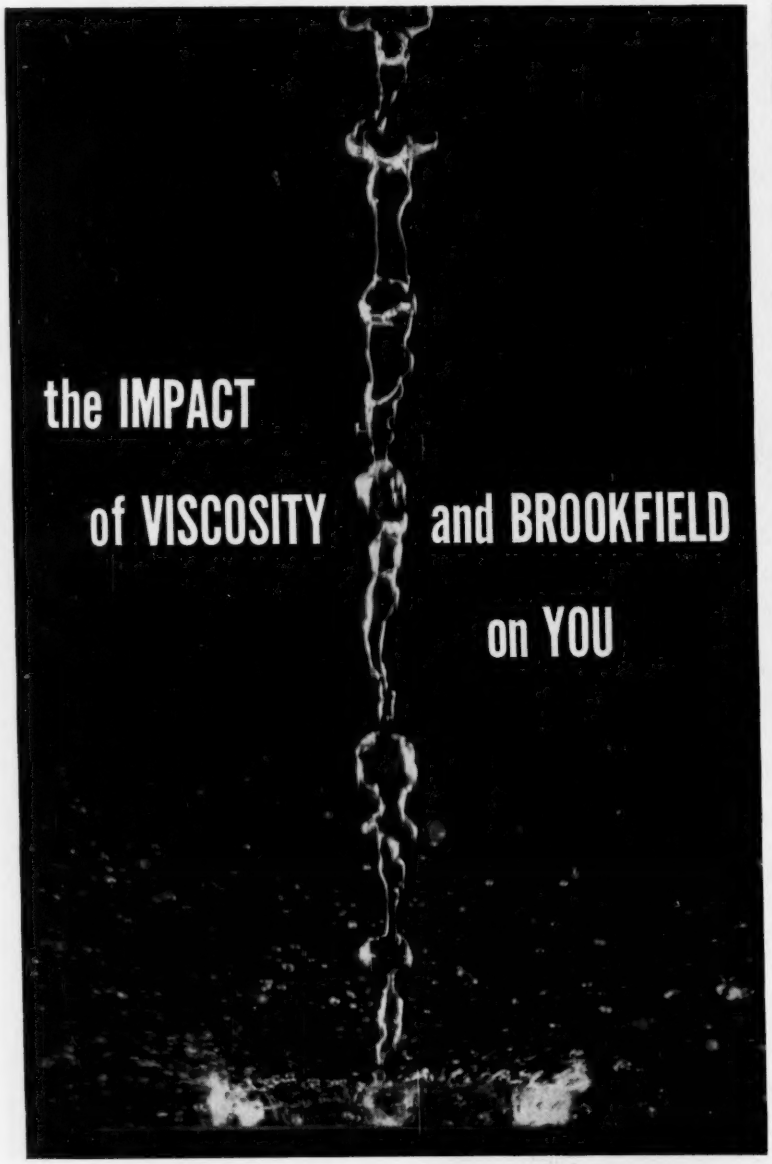
For years, fading brakes (i.e., brakes becoming gradually less effective as they get hot) were the special problem of racing drivers, pilots landing big and fast airplanes, and drivers of logging trucks in the Pacific Northwest. But in recent years, the brake-fade problem has been added to the woes that plague the modern motorist.

It's a daily problem, for example, with Californians driving to work on the Los Angeles Freeway: speeds run to 60 mph.; there's a stop every half mile. Express highways, high horsepower, and styling that conflicts with engineering realities all aggravate the braking problem for today's motorists.

Hope in the Lining: The automotive industry so far has found that power brakes aren't good enough, air brakes and disk brakes too expensive to effectively control brake-fade. Better linings appear to be the best hope. The only American car—a Chevrolet Corvette—entered in the Sebring, Fla., sport-car race will have ceramic-metallic brake linings made of Cerametalix, a product of Bendix Aviation Corp.'s Marshall-Eclipse Div. (Troy, N. Y.). Bendix last week received a patent covering Cerametalix, a combination of the ceramic, mullite (an aluminum silicate made by heating cyanite to high temperatures), and various metals (to give structural strength). It's one of the first of several linings of this sort offered by U. S. brake-lining makers.

Heat's On: Special virtue of ceramic-metallic linings is their resistance to heat-deterioration. Bendix began developing its material 10 years ago when it discovered that only 20% of brake-lining wear results from actual work done, 80% coming from the 600-700 F temperatures created in the brake drum.

Because it is particularly good on heavy-load and high-speed braking, Cerametalix is already used in aircraft, heavy truck and railway brakes; construction equipment, marine and machine-tool clutches. But, although they promise a simple answer to today's fade and wearing problems,



Like color, pH, stability and composition, the flow properties of any material . . . its Viscosity . . . is a product dimension which can't be ignored! Accurate viscosity measurement, evaluation and control can turn chance to science . . . waste to wealth.



Today, thousands of profitable processes depend upon accurate viscosity control and upon Brookfield viscosity measuring instruments. A fully-descriptive brochure — devoted to viscosity in general and illustrating Brookfield viscometers and allied equipment is yours without obligation. Write today!

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STOUGHTON 114 MASSACHUSETTS

ceramic-metallic linings have drawbacks.

Root of All Evil: The principle objection is cost. Ingredients of ceramic-metallic linings cost more, capital investment to make the linings is more (they're briquetted by short-lived dies), and more manufacturing operations are required. Because no available press is big enough, and because the materials are too brittle to flex, and because they conduct heat so well that they break down adhesives, they must be spot-welded to brake shoes in small blocks, rather than bonded on in continuous strips as organic linings are, which hikes the cost.

Formulation offers the greatest hope for cost reduction. Formulation changes are also being explored in an effort to answer other criticisms of auto makers. Ceramic-metallic linings as now formulated are excellent in high-speed stops, comparatively poor at slow speeds (and in other low-brake load situations, such as use in the lighter low-price autos). At this lighter, cooler work, the brakes build up friction, and what starts as a gentle, easy stop ends with a slight jerk.

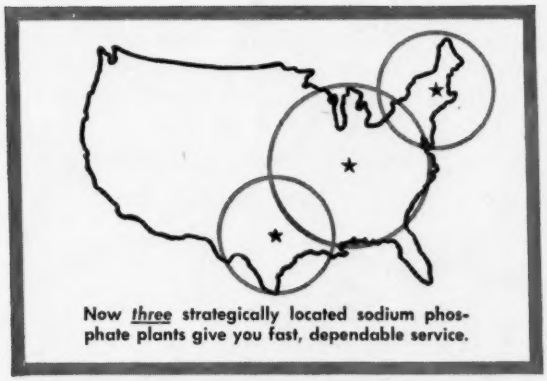
Also worse at low speeds is noise. Until a few months ago, ceramic-metallic lining-equipped automobiles came to literally screaming stops. Many auto makers, Oldsmobile, for example, will tolerate no noise whatsoever from brake linings, but Bendix has now reduced the noise level to a slight squeak that Chevrolet could probably tolerate if it could take the price, the low-speed jerk, and other drawbacks.

Compromise: Oldsmobile might well be the first passenger automobile to use ceramic-metallic brake linings. Bendix has come up with a combination brake shoe with two segments of organic lining and one small block of Cerametalix, which could show up on the '58 Olds. This is a compromise, probably an interim arrangement, which eliminates the major disadvantages of a full Cerametalix lining, but still gives considerably more resistance to wear, heat and fading than a conventional organic brake.

Meanwhile, Bendix (and other major brake-lining makers) are looking for a fully satisfactory all-ceramic-metallic brake. They figure that whoever is first to mount an ambitious-enough testing program will get the answer—and the business.



1,500,000,000 happier wash days . . . because of SHEA!



Now *three* strategically located sodium phosphate plants give you fast, dependable service.

Washes are brighter and cleaner today — thanks to modern laundry detergents. One of the principal ingredients of these wonder cleaners is sodium polyphosphate — in many cases, Shea sodium polyphosphate.

The demand for Shea sodium phosphates has grown so rapidly that in 1956 Shea built two new plants to meet the requirements of detergent producers. This year, Shea will ship them enough sodium polyphosphates to make over 15 lbs. of detergents for every family in America — enough for 1,500,000,000 family washes.

A basic chemical producer achieves a position like this only by supplying products of proven quality . . . and by giving outstanding service.

Do you use Shea sodium phosphates? If not, ask for samples.

Sodium Tripolyphosphate
Tetrasodium Pyrophosphate
Disodium Phosphate
Trisodium Phosphate
Sodium Hexametaphosphate
Dicalcium Phosphate
Phosphoric Acids, Food and N. F. Grades
Phosphatic Feed Solutions
Organo Phosphorus Compounds
Elemental Phosphorus

SHEA CHEMICAL CORPORATION

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Sitting on a Red Hot Product Idea?



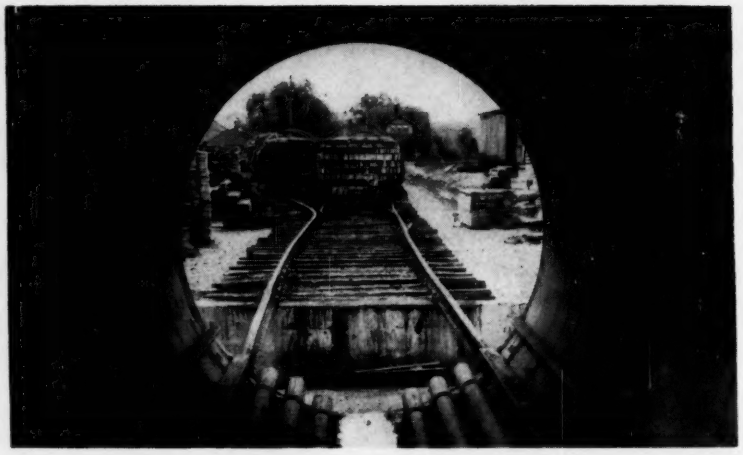
Consult Evans Research

to get your idea off the ground. Consider these advantages when you consult Evans Research:

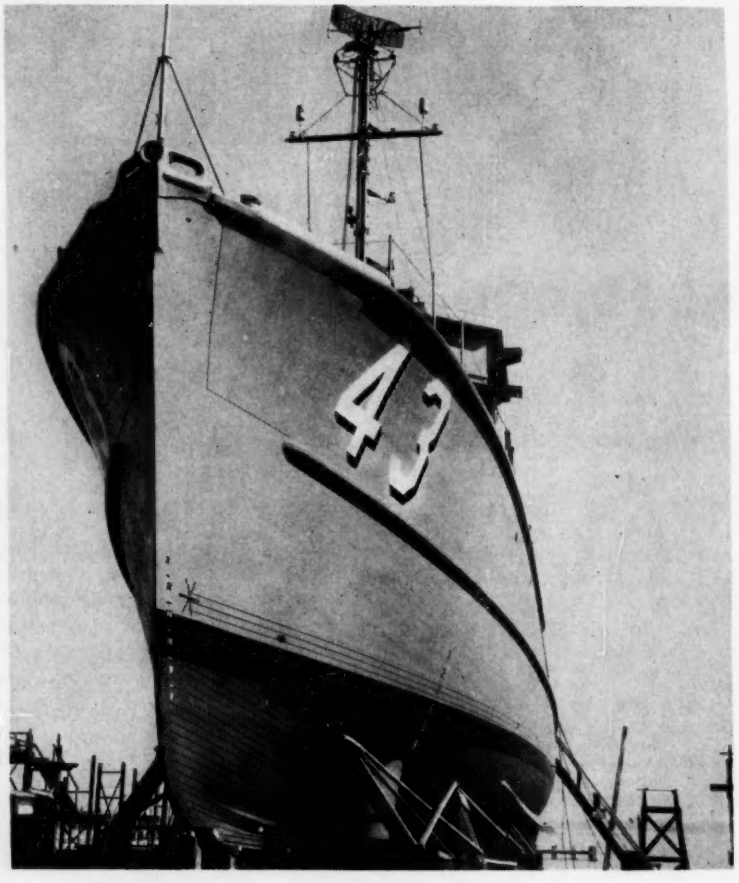
- . . . no need to interrupt current activities
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- . . . and many more. We'll be glad to discuss them in terms of your objectives. Write today.

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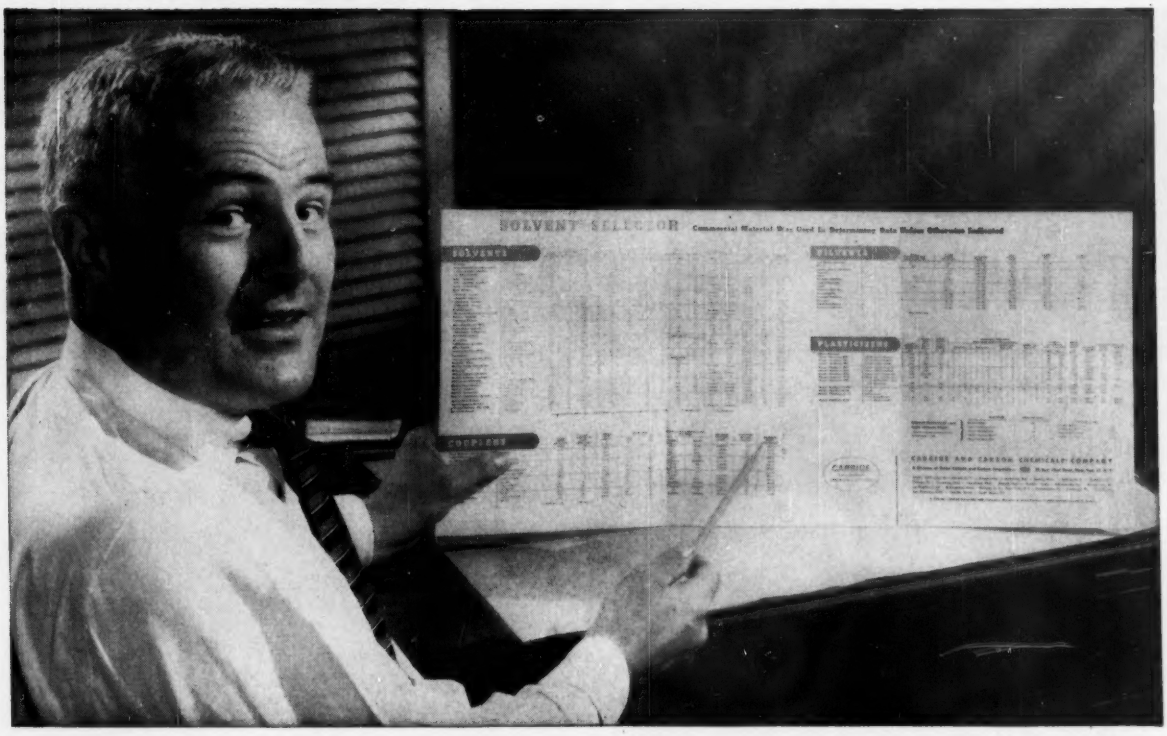


Chemically treated wood goes . . .



. . . down to the sea in ships

By using pressure-treated red oak heartwood, the Navy supplements untreated white oak as a construction material for ships such as the just-launched minehunter, *U. S. S. Bittern*—whose hull must be nonmagnetic. Koppers Co. supplied the Wolman salt wood preservative and 7,000 lbs. of Penacolite resorcinol adhesive used in laminating.



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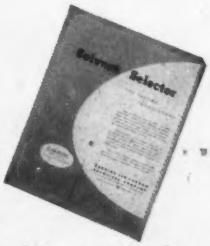
Whatever your solvent needs, you'll always benefit from the availability of CARBIDE's complete range of esters, ketones, alcohols, and glycol-ethers—plus many other types of solvents for specialized applications. The big benefit is that you can choose the solvent or solvent combination which best suits your requirements. In addition, CARBIDE's strong raw material position assures you of constant availability and dependable delivery.

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Please send me the Solvent Selector—a six-page folder presenting the latest data on solvents, plasticizers, couplers and diluents.

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Company_____

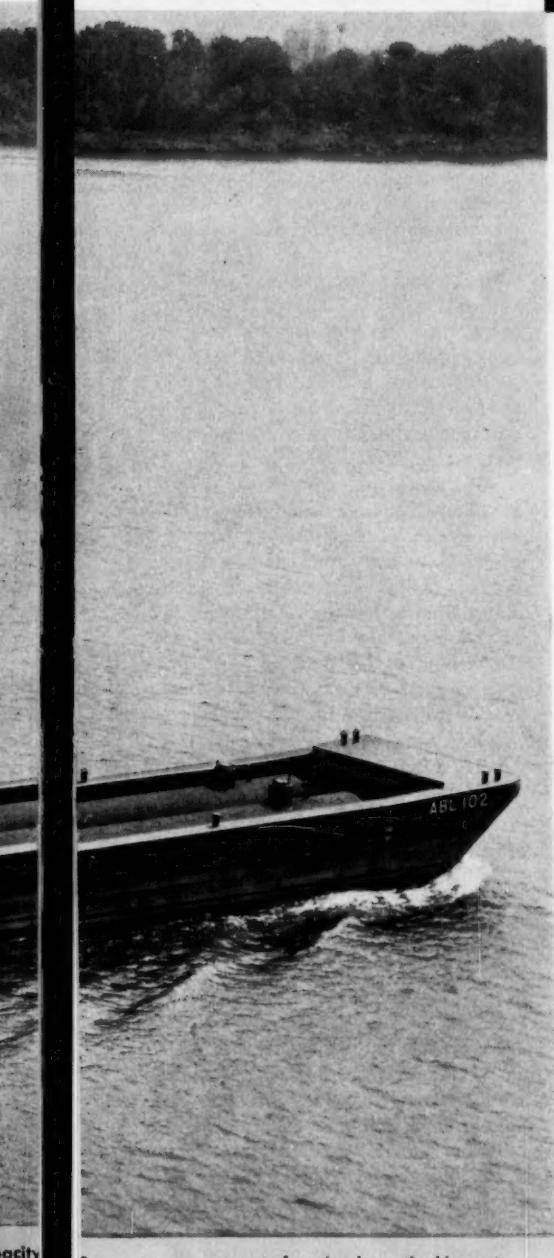
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Newest member of Pennsalt's Barge Fleet steps
Pennsalt Chemicals
ABL 102
Barge ABL-102—100,000 gal. capacity

up deliveries of...

CAUSTIC SODA



Separate compartments for mixed caustic shipments.

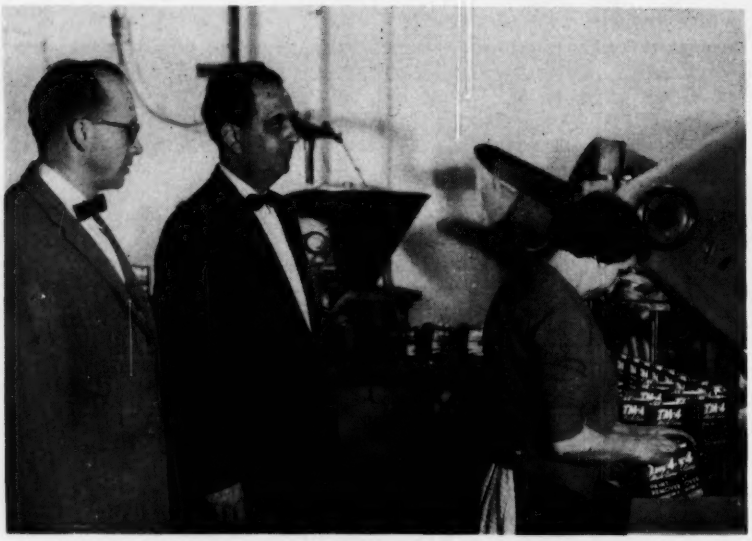
Meet the new ABL-102!—latest addition to Pennsalt's fleet of caustic barges. Designed with two 10,000-gallon and two 40,000-gallon compartments, the new barge makes it possible for customers to receive 250-325 dry tons of material in one shipment—or mixed bulk liquid shipments of caustic soda and caustic potash.

Thus, it is now practical to order both caustic soda and caustic potash in combination shipments—or to order as little as 250 tons (equal to 8 tank cars) of caustic and gain the economies of water transportation.

Potash and soda users, large and small, who are near inland waterways, are gaining freight savings by using the Pennsalt barge fleet. Even if you lack dockside facilities or are not on a waterway, it may pay you to check your caustic needs with Pennsalt. Frequently it is less costly to ship by water, then by rail or tank truck, than direct by rail or truck. Ask your Pennsalt salesman for the facts.

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Pennsalt of Canada: Hamilton, Ontario

Pennsalt Chemicals



WB'S PERRY, KELL: They're finding profit in being the handyman's helper.

Refinisher Encores Remover

After you've made a name for your specialties firm with a paint remover, what do you turn to for a follow-up product? Winfield Brooks Co., Inc. (Woburn, Mass.), which climbed to prominence as maker of TM-4 paint remover, this week launches a new brushless wood finisher in bidding to repeat the success of its remover.

Like the pain remover, the new wood finish breaks new ground as a product—although it is not a stain, it is applied to wood with a cloth or rag, rather than by a brush. Its maker claims it dries so fast that dust or ashes dropped on the surface during application may be brushed off; the surface may be second-coated immediately. Too, its price is above that of most furniture finishes: pint cans retail for $2.50.

Termed a sort of combination lacquer and varnish, the finish produces a transparent coating, is available in a variety of colors. The formula is said to be novel, but the firm's description of it, "a mixture of polymers," doesn't explain just where the novelty comes in. The finish, although hard, is not claimed to be resistant to hot water or alcohol—and, of course, TM-4 remover will take it off.

Aside from providing Winfield Brooks with a product contrasting to its paint remover, the new coating is unusual in that it is about the first of the company's products whose formulation cannot be traced directly to the firm's primary interest in detergents and surface-active agents.

Solid in Soap: It was to make and sell industrial soaps that Winfield Brooks was originally formed in 1951. North Carolina- born Ken Perry, president of WB, left his job in Lever's new product development department to start the company, but soon discovered that demand for industrial soaps was not large. Even the addition of janitor supplies to the line didn't help much.

Seeking a more profitable enterprise, Perry began making products—hot soaps, steam cleaning compounds, glass cleaners, aluminum cleaners—for automatic car-washing equipment. WB gave broad service in this line—it engineered car-wash plants, provided architects for prospective plant owners and had special washing equipment manufactured. The car-wash business paid off—the firm is still leading supplier of materials for that trade in the New England area.

Product Plus Promotion: But Perry wasn't satisfied with the volume. As a result, he looked for, and found a way to make a water-soluble paint remover. Products based on methylene chloride, as was Perry's—certainly weren't brand new. But as Perry says, he has "yet to find a starting formula suggested by a raw material supplier that's a commercial formula"; he utilized his detergent knowledge in making his remover quite readily emulsifiable.

The company had a sales idea, as well as an effective product. Virtually no paint remover had been vigorously promoted. By interesting the homehandyman as well as editors of many newspapers (the newspaper supplement *American Weekly* was among those proving helpful) and by skillful promotion at home shows, TM-4 was brought to the attention of do-it-yourselfers.

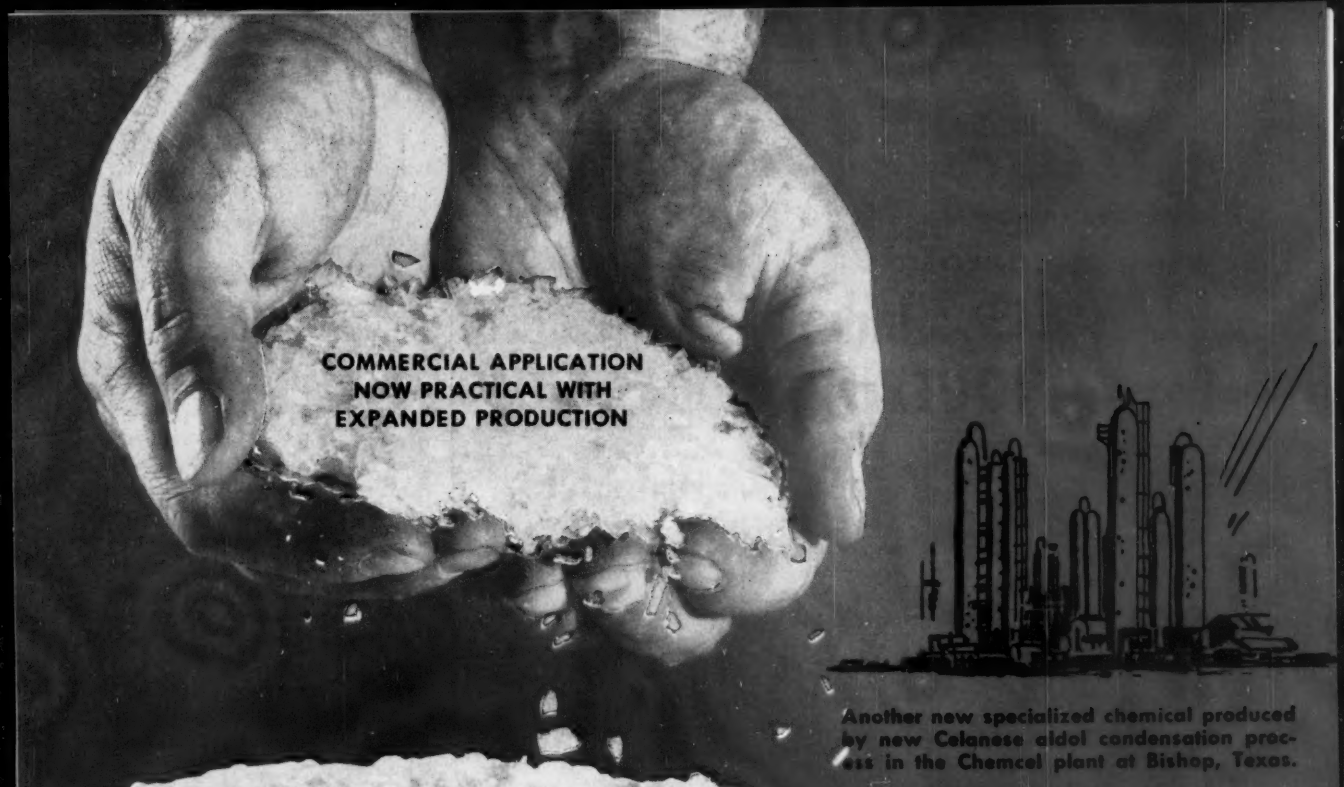
TM-4 had a few fortunate breaks, as Sales Manager Ted Kell points out —e.g., in renovating Liberty Hall in Philadelphia, TM-4 was used in stripping the 18-20 coats of paint off the interior of the structure to allow repainting on bare wood. TM-4 got plenty of publicity.

All these breaks contributed to the remover's booming sales; it's generally regarded as the top-selling remover in the U. S. now. And lately, a number of similar products have come along. They're alike not only in mode of action but also in price—TM-4 at the seemingly high price of $1.50/pt. (two or three times the price of conventional materials) has set a standard that has been widely copied.

As a result of TM-4 success, WB has had to expand. At a new site in Woburn, the firm has added the first of four new buildings planned.

Promotion Pattern: The firm's latest product, the TM-4 wood refinisher is being merchandised in a manner similar to that used for the remover. It has been test-sold in Boston's Jordan Marsh department store and retailed via Alden's mail-order house. Its package is similar to the paint remover's—an "F" can with white lettering on a body of red and blue. The remover has red top and blue base; the new refinisher, blue top and red base. Perry is still uncertain whether the product identification so gained is worth the possibility of confusing the buyer.

While swinging into production of the new coating, Perry continues to use his soap and detergent experience by working as a consultant for firms in the New England area. As for the future, Perry seeks more diversification for WB, hopes to do contract formulation and packaging. He has the equipment he needs, the formulas he



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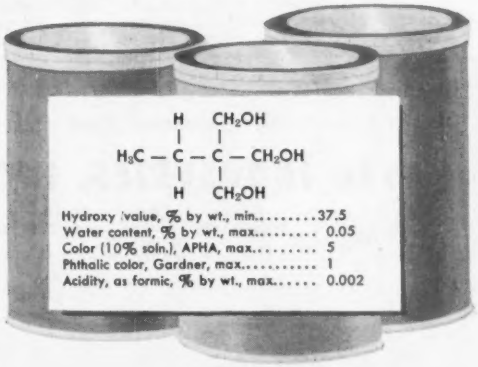
Processing of polyurethanes is made easier through the use of this free-flowing, flaked polyol. Formulations containing trimethylolpropane mix more readily with diisocyanates. Its low melting characteristics and low water content are added features of particular importance in polyurethane coating formulations.

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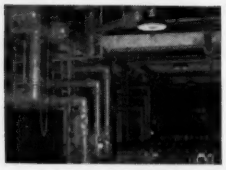
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has proved successful. With a just-completed lab at his disposal, he figures Winfield Brooks can sell service to industry just as well as it has sold products to consumers.

Fungistat Fuss

Persistent — though unfounded — rumors that biphenyl-wrapped citrus is harmful and may cause cancer are causing a shift in packing methods used by the present top supplier of citrus to Europe—Israel. Requests from England (Israel's No. 1 customer) and the Continent for non-biphenyl-wrapped fruit are on the up swing although fruit packed in biphenyl-treated material reaches markets in a much more attractive condition.

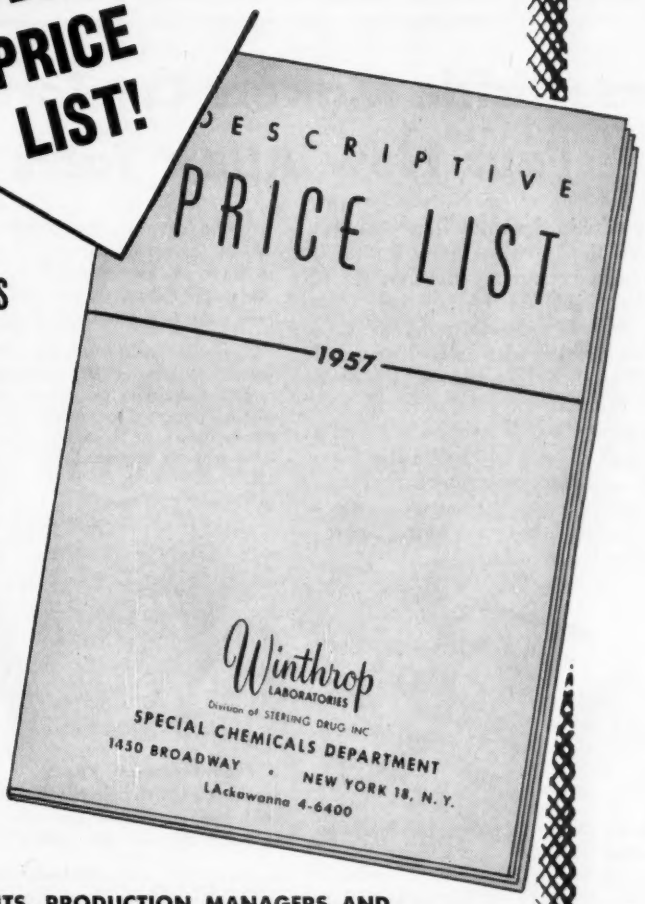
What's behind the rumors? According to Israel sources, the campaign originates with West Germany's "Green Front," a group of farmers and fruitgrowers who are worried about increasing consumption for the fresh fruit market from citrus growers. The campaign, report Israel growers, is "very vigorous, with some success spreading abroad." And this, they add, is going on "despite the fact that not a single German scientist has confirmed the rumors, nor has a single authority banned use of biphenyl."

The same country, but a different group, was pinpointed as the source of the rumors by an American agriculturalist who told *CW*: "Some scares in Europe have been started by the Germans, who made an *a priori* assumption that biphenyl, being a phenyl, would cause cancer."

Israel naturally doesn't want to stop using the biphenyl, feels that it's the only way to preserve the fruit during transit. And it has a big market at stake. Since Spanish citrus growers are in bad shape because of an unusual frost, Israel is picking up the slack, is annually shipping about 8 million cases of citrus.

Citrus specialists in the U.S., queried about the situation, were a bit surprised to learn of the Israel development; they wonder why extensive testing by the U.S. Food & Drug Administration isn't being used to counter the rumors about any deleterious effects biphenyl might have. Until the middle of '56, the U.S. citrus industry was nervously expecting FDA to outlaw it at any time. But FDA ran

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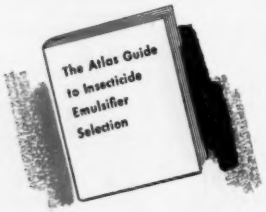
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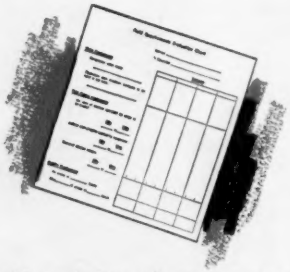
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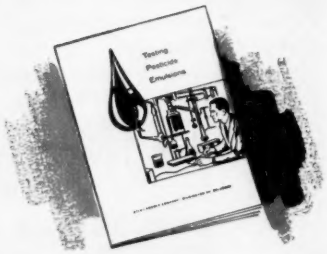
1. *Atlas Guide to Insecticide Emulsifier Selection* . . . steers you to emulsifier selection for best performance in *each* formula, or to a blend that works well in *all* your formulas. It shows you how to adjust for mixed solvents, for changes in solvents, for various field dilutions, for water hardness, for toxicants you may want to add to your line.

NOTE: Because the Guide is useful only to volume formulators of chlorinated hydrocarbon insecticides for agricultural use, it will be presented personally by an Atlas representative to those who request it on their company letterhead.



2. *Field Evaluation Charts* . . . a guide and check list to help the chemist set up field use conditions and desired performance. Available in pads.

3. *Suggested Test Methods,* developed by Atlas, add speed, accuracy, and simplicity to lab work. They're explained in a movie, booklet and reprints of technical articles.





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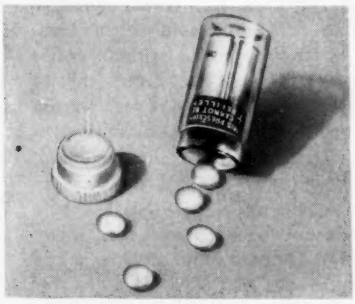
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chem-memos

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You can't control the weather *outside* a tablet, but you can keep things dry *inside* by using Atlas mannitol as a filler. Mannitol, a chemical isomer of Atlas sorbitol, is less hygroscopic than any other carbohydrate filler. It absorbs less than one-third as much moisture as lactose, for instance . . . and only 3% as much as starch.

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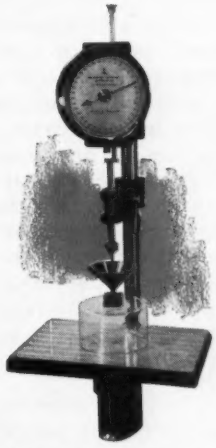


Riker Laboratories "Pentoxylon®" is typical of fine pharmaceuticals that use Atlas ingredients.

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In making candy, too, it pays to "go scientific." Laboratory testing and pilot production can help you to find ways to improve the candy you make . . . to evaluate new ingredients . . . to try new formulas that will capture the consumer's taste. It's a valuable way to maintain quality of your product.

Atlas can help you with useful suggestions on ways to make small scale production batches of candy, and to perform simple, practical tests that give you quantitative results. Using methods we have developed, you can make batches as small as 2 pounds—no need to risk 1000-pound formulas.



Typical of the simple, economical testing devices for evaluating candy is this penetrometer, which measures softness . . . can be used to check the rate at which candy becomes firm or hard in storage.

Our own interest in small-scale candy making and testing comes from the increasing popularity of SORBO®—Atlas sorbitol solution—as a candy conditioning ingredient. In our own lab, we have a miniature candy factory, complete with testing instruments. The methods we have developed are explained in a booklet and a 20-minute color movie—both available on request.

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a thorough analysis with the help of the Dept. of Agriculture, and concluded that the compound was not cancer-producing nor otherwise harmful. On July 22, '56, FDA set a tolerance for biphenyl of 110 ppm. on or in the fruit under provisions of the Miller Amendment. According to some, on the basis of the findings, there was really no need for any limit being set.

Nevertheless, there's still a chance that biphenyl may have seen its day as a citrus fumigant and fungicide. The citrus industry makes no secret of its desire for a substitute for the material (*CW, Aug. 8, '53, p. 32*). There are two reasons for this: (1) odor (rather like carbolic acid) and (2) insistence by FDA in Aug. '56 that industry observe Section 403K of the Food and Drug Act, which stipulates that no fruit can be sold with a chemical in any way added, without notice of such addition. This means that to comply with the law, every carton shipped must be labeled or must contain a statement that biphenyl is used; and a sign must be displayed over the fruit in the grocery store. The rule is rather widely ignored, but FDA might get tough about it. The citrus industry feels that such signs are serious impairments to fruit sales. Also, some take issue with FDA's logic in okaying so large a tolerance for biphenyl, then requiring this labeling.

About the only promising substitute now being researched: simple ammonia. Use of ammonia is the result of studies carried out at the University of California's Riverside Citrus Experiment Station. But the university's Al Boyce tells *CW* there are still problems to be worked out before ammonia is a thoroughly satisfactory substitute. As used now, pellets of ammonium sulfate mixed with an alkali are placed in the shipping cartons; moisture from the respiration of the oranges cause sulfate and alkali to react and produce the desired amount of ammonia gas. The main problem is psychological—people buying full cartons find the pellets and wonder what they are. Scotland Yard wondered, in fact, when it first found the pellets in Sunkist's fruit shipments to England, fussed a bit until it was reassured by Sunkist officials.

Sunkist hasn't changed entirely to ammonia—only 5% of orange shipments requiring fungistats are packed



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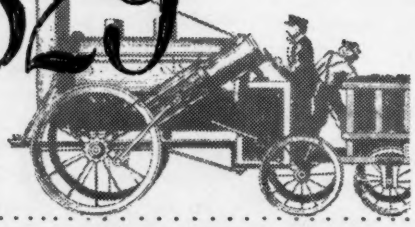
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SPECIALTIES

with ammonia. Not all shipments need a fungistat except at the end of the season, when fruit is susceptible to spoilage.

Looking ahead, ammonia — which FDA approves without any limitation —will probably get more assignments to protect citrus, may possibly be incorporated in sheets placed in cartons, as biphenyl now is. Ammonia won't be used for lemons, since lemons have a different spoilage problem — one that can be checked by biphenyl, but not, as yet, by ammonia. Another thing may slow down use of ammonia; at present, at 2¢/carton, it's twice as expensive as biphenyl.

PRODUCTS

Metal Top-Coat: To protect the thin film of alloy deposited in vacuum metalizing of metals, Logo Inc. (Chicago) has introduced a new coating, M-241. It is sprayed and baked on the metalized surface, is said to provide abrasion resistance almost 50% better than the average lacquer coatings used in vacuum metalizing.

•

Double Thick: Sel-Rex Corp. (Newark, N. J.) says that by using its Sel-Rex Rhodex it is obtaining rhodium electroplates at least twice the thickness resulting from conventional rhodium formulations. Sel-Rex claims it consistently produces electroplate in thicknesses exceeding 0.001 in. without fracturing, says that thickness is limited only by what a customer is willing to pay.

•

Liquid Defoamer: Surfynol 104A is a new liquid defoamer for aqueous systems in which foaming is a problem. According to Air Reduction Chemical (New York, N. Y.), manufacturer, the material, a ditertiary acetylenic glycol solution in 2-ethyl hexanol, is especially recommended for use in latex and resin dispersions.

•

Air Conditionerette. A "personal size" air-conditioner aerosol with a metered valve has been introduced by Woodlets Inc. (Buffalo, N. Y.) The small dispenser is claimed to provide 500 individual sprays. The product's active ingredient, called Ozium, is made up of propylene glycol, triethylene glycol, isopropanol and other chemicals. The propellent is a fluorinated hydrocarbon.



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Manufacturing costs can be reduced because more low-cost oils can be used.

Resin and paint manufacturers can now offer new and improved products with Oronite's new, advanced raw material — Isophthalic. Contact any Oronite office for complete information—or ask your resin or paint manufacturer about Isophthalic.

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BIG COMPANIES:	SMALL COMPANIES:
On manpower shortages—disagreement	
"The shortage is real—we won't get all the men we need this year."	"The technical manpower shortage isn't as bad as a lot of people think it is."
On manpower quality—common problems	
"It's easy to get all the mediocre engineers you want, but good ones are hard to come by."	"There's always a shortage of good men, regardless of what year it is."
On recruiting—two points of view	
"More recruiting money was spent last year than ever before—high spending will likely be necessary this year, too."	"We can't hope to compete with the big boys—have to catch good men on the rebound."

Shortage Is a Matter of Size

The statements above, made by production executives last week with varying degrees of pain, point up clearly the situation with regard to the availability of chemical engineers for production jobs: there is very little agreement on the size of the shortage. But no matter how bad it is, most chemical companies agree that:

- It's short-sighted economy to lower hiring standards.
- A lot can be done to utilize existing engineers.
- A sound program for training young engineers to bring them along gradually is essential.

How Short Is Short? Engineers Joint Council figures are quite explicit on the availability of new engineers. They tally 26,300 B.S. engineering degrees in '55-'56—up 16% from 22,500 in '54-'55. And chemical engineers account for about 10% of the total.* Undergraduate enrollments for '56-'57 are 251,100, up 13% from 221,450 in '55-'56.

But though more engineers will be available, those figures should be judged against proper background. For one thing, as pointed out this week in "Engineering Enrollment in the United States," (New York University Press), despite the bigger chemical engineering enrollment, numerically, it had reached only pre-World War II levels last year.

Also, the expansion of the chemical industry and the record number of new projects being undertaken put a drain on the supply that's all out of proportion to the increased availability.

Who Hurts Least? In general, the medium-size and smaller firms seem to be faring better than their larger competitors. For example, Victor Chemical says it hasn't been more than 5-10% under its quota. Kaiser Aluminum and Chemical was able to come within 99% of quota last year, hopes it can do as well in its quest for 250 men this year. National Aluminate and Lindsay Chemical, plus several Gulf Coast firms, have been able to handle needs in spite of the shortage, they say.

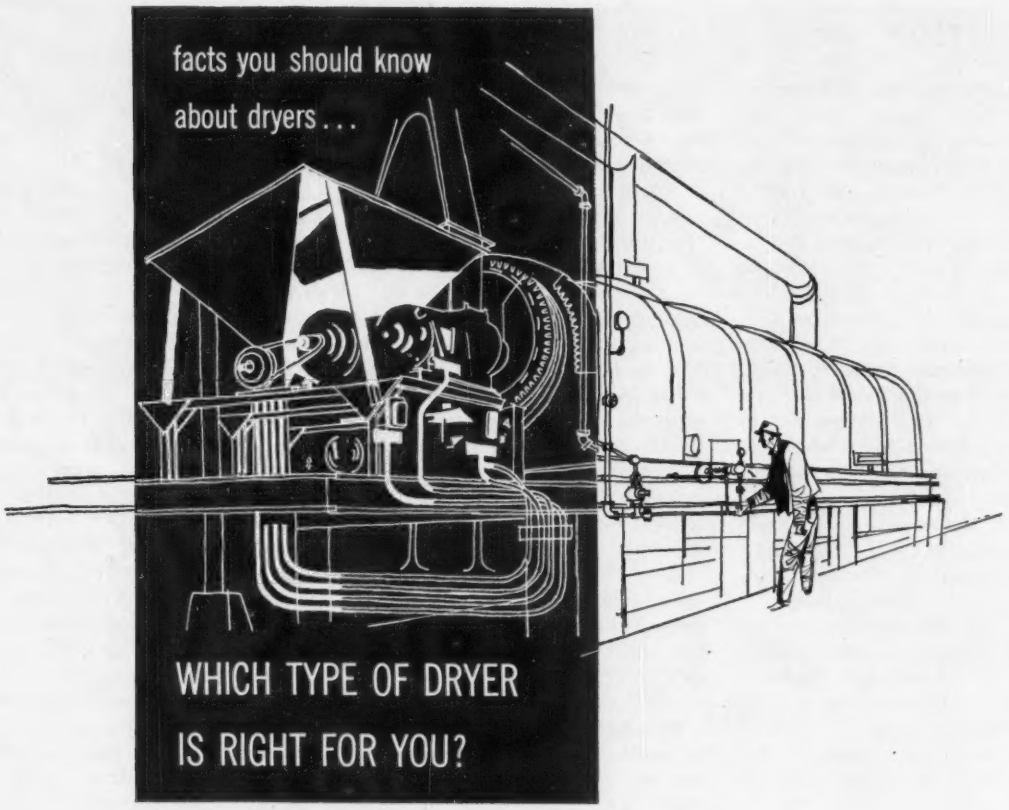
Not that it's always been easy: Stauffer has usually been able to fill production openings quickly, but, in addition to new college graduates, has relied on men from other companies seeking greener pastures. Stauffer's Mark Anthony points out that prior to '56, more money was spent each year on recruiting. "And it will probably be necessary to spend as much this year," he adds.

But some of the smaller companies can't afford that sort of pace. One that has continued to staff successfully says: "We can't hope to compete with the big fellows. Only a token effort is made at college recruiting—if we decide to bother at all. And we can't match their salaries, titles and prestige, either. We have to concentrate on catching good men on the rebound—men who find they would rather work for a small company and live in our area of the country."

The shortage varies considerably with the plant location, too. "Research labs are often set in a swanky spot, but some of our plants are out in the middle of nowhere," says one recruiter. "We've lost many a production prospect because of it."

Big Firms Worse: Carbide is a

* Mechanical: 26%; electrical: 22%; industrial: 6%; civil 18%.



For over 55 years, Louisville Dryers have been solving industry's drying problems and effecting marked economies. The following is intended as an introduction to selecting the right type of dryer.

Q. *What types of dryers are there?*

A. Many types. They can be classified in two basic categories, namely, batch type and continuous.

Q. *What is proper application of the continuous type?*

A. Where large enough capacity is required to make savings in labor, space, and fuel advantageous.

Q. *What are some other advantages of the continuous type?*

A. Uniform quality of dried product. Lower drying cost.

Q. *What types of continuous dryers are most used?*

A. Rotary, Conveyor, Flash, Spray, Atmospheric Drum.*

Q. *Do all of the above types handle the same kind of material?*

A. No. While they discharge a dried solid, Spray and Drum Dryers are fed with a liquid. (Liquids and thin slurries can be handled in the other types by means of special designs or auxiliary equipment, but seldom are).

Q. *How can I be sure of getting the right type of dryer for my operation?*

A. Louisville engineers start by surveying your needs. Then, after considering the pertinent factors, they make recommendations for dryer type, heating medium, etc. Their recommendations can be proved by practical drying tests in General American's pilot plant. Your Louisville Dryer is then designed and built to suit your particular purpose and to fit your individual needs.

Q. *How can I investigate the matter in greater detail?*

A. Call in a Louisville engineer. No cost or obligation.

*Discussions to follow will deal with the subject in more detail.

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good example of what is happening in large firms. Carbide filled about 85% of technical requirements last year, feels it did pretty well. But this year, UCC's Carbide and Carbon Chemicals Co. alone has about 175 production slots to fill (about half of the Chemicals Co.'s over-all needs) —a 60% increase over last year.

"The shortage is going to be with us for some time," says Bill Heidenreich, Carbide and Carbon's college relations and recruiting director. He points out that while the number of college engineering students is increasing, Carbide's needs are increasing at a much faster pace.

Point of Reference: To a certain extent, much of the disagreement about the engineer shortage stems from a lack of a point of reference. "There's a big difference between actual and theoretical requirements," says EJC's Bill Cavanaugh. "What is needed is a hardheaded, more detailed analysis to determine the real over-all magnitude of the requirements so that more accurate projections can be made."

Alex Cochran, Celanese's manufacturing and engineering vice-president, gives an indication of how difficult this would be. "We have two technical manpower figures for each production department of the Chemical Division," he says. "One is the minimum we need in order to operate. The other is the number we could use effectively on improvement of plant processes, efficiencies, etc., thus paying its way. Naturally, we have to meet the minimum figure. Above that, where does the shortage start?"

Quality Needed: However bad this shortage, most companies are in accord that it doesn't pay to lower standards. Cyanamid, for example, says it will not get all the production engineers it needs—particularly for process improvement and development. But it says: "It's easy to get all the mediocre engineers you want. It's the good ones that are hard to come by."

Others, not short of quotas, have this to add: From National Aluminate —"There's always a shortage of good men, regardless of what year it is." From Lindsay Chemical—"We're always actively looking for good men, and will make room for them."

In fact, only two firms admitted standards had been lowered somewhat—and neither reported it could meet needs in spite of the eye-winking. (Another firm says that it could be more selective and still fill its quotas.)

"There is no real substitute for quality," says Carbide's Heidenreich. "Top men and mediocre ones start off at the same level. In a few years, the good man is contributing original thinking and more than carrying his share of the load. The mediocre one isn't—he just doesn't develop, is often a drag. And this means a shortage of manpower will show up at the management level a few years from now."

Better Use: Proper utilization of engineers and development of management-level manpower have caused more than one gray head. Monsanto is starting an experiment with some management jobs, has moved in some liberal arts graduates to replace technical men. Point to be proved: whether the liberal arts graduates' lack of technical background can be offset by their ability to get ideas across to the work force better than technical men can.

Du Pont and many others have tried this for many years with varied success. Also, many have upgraded foremen for lower-level supervisory jobs, making a deliberate effort to free engineers for more complicated jobs.

Training Important: Most firms agree on the value of training programs. Some run the gamut from "sink-or-swim" to elaborate formal plans. In large companies, it often varies considerably from plant to plant and department to department. Olin Mathieson's philosophy is typical: "We believe a development and training program will be successful only if it fills pertinent plant needs at the moment and tries to anticipate some of the problems that will be encountered by management. Each program should be tailor-made."

On-the-job training with coaching and guidance by line management is the most popular form of training. It's least vulnerable to personnel shortages; the men "learn while they earn."

Carbide believes a lot of men don't like formal training programs as such, says that on-the-job training works out best in the long run. Most important: new and specific projects to make the man feel he is contributing, keep him from getting bored.

Even firms with formal programs, like Kaiser, stress specific projects

Case History: Training Program

Stauffer's West Coast industrial chemical division launches a formal training program for new men this spring. Tailored to the individual's needs, it's patterned after a prototype program successfully tried out last year. Its objective: to bring new engineers to the brink of higher responsibility as fast as possible.

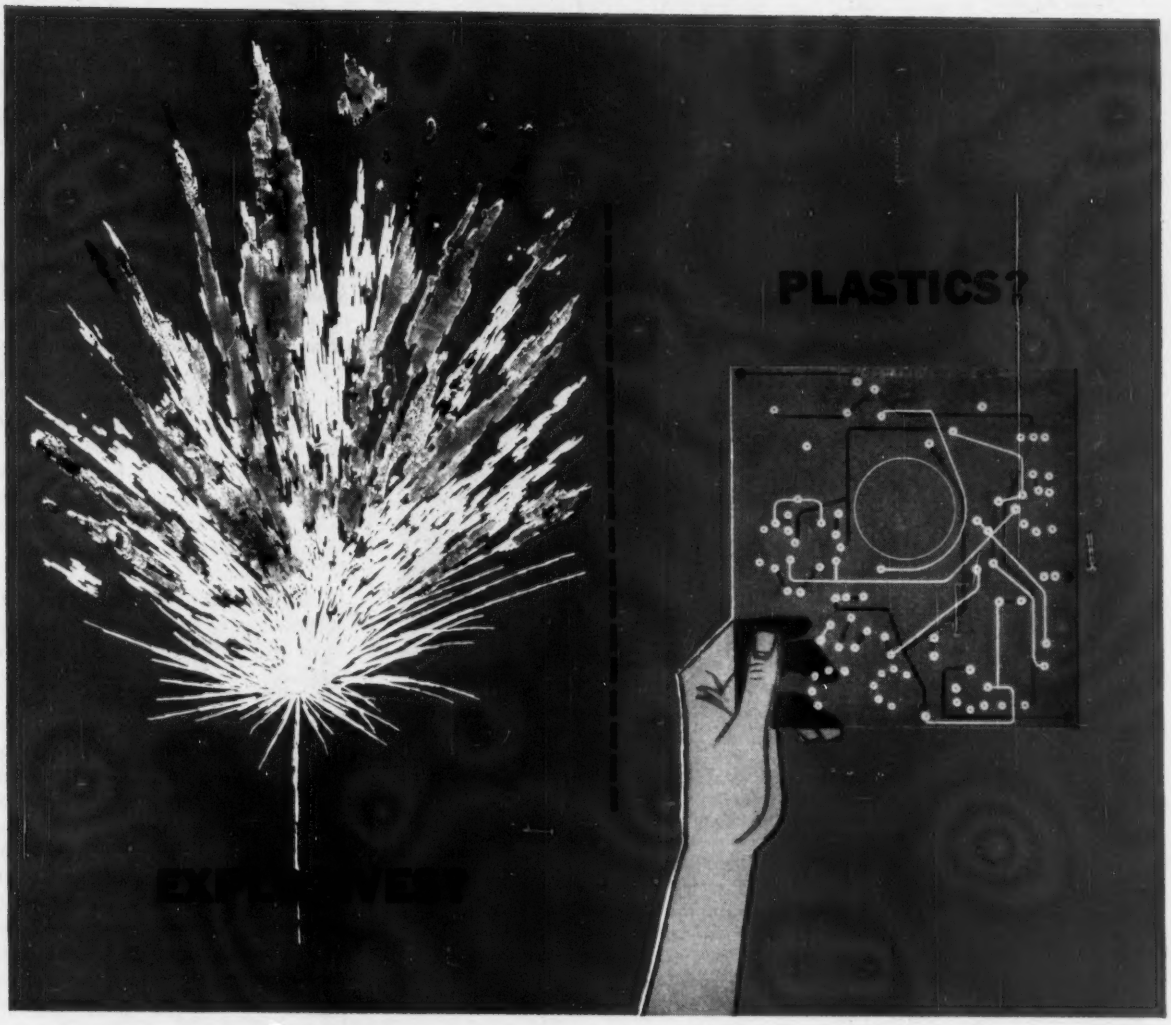
The new 9½-month program replaces on-the-job coaching and job rotation. A trainee follows this schedule:

Control lab on routine analysis—3 months. "The control lab is still a good place for a new man to get his bearings and earn his keep," says Max Spealman, Western division manager.

Operator training on different jobs—3 months. The jobs included digester operation, evaporator operation, product finishing and packing for last year's trainee.

Acting department foreman—6 weeks. Foreman is shifted to other work so trainee can run the show.

Need for the program was underlined last year when the pilot trainee's two-month stint in engineering was canceled. Reason: he moved into production slot because of manpower shortage.



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that trainees can handle. But they aim the program at breaking the college graduate into the ways of industry as gently as possible.

Few firms have changed training programs because of the shortage. Says Victor: "The program isn't different because of the manpower problem, but because of changing ideas and improved methods."

Stauffer, for one, augmented its on-the-job program a little over a year ago with a formal evaluation of each man's progress by three superiors having direct contact with the man. It feels that periodic, honest evaluation of strengths and weaknesses, consultation with the man, are essential to management-level development.

Its Western Industrial Chemical Division has gone a step farther with a formal program (*see box*) inaugurated specifically to bring promising men along as quickly as possible to positions of higher responsibility.

A few firms readily admit that they've had to bring men along too rapidly at times, with near disastrous results. It is unfair to the man as well as to the company, says one. There is always the problem of filling that middle management group. It takes both time and training as well as selectivity. Perhaps that's where the small firm that sometimes can't compete in college recruiting has the big edge, provided it can get the man already trained.

Aid in Esterification

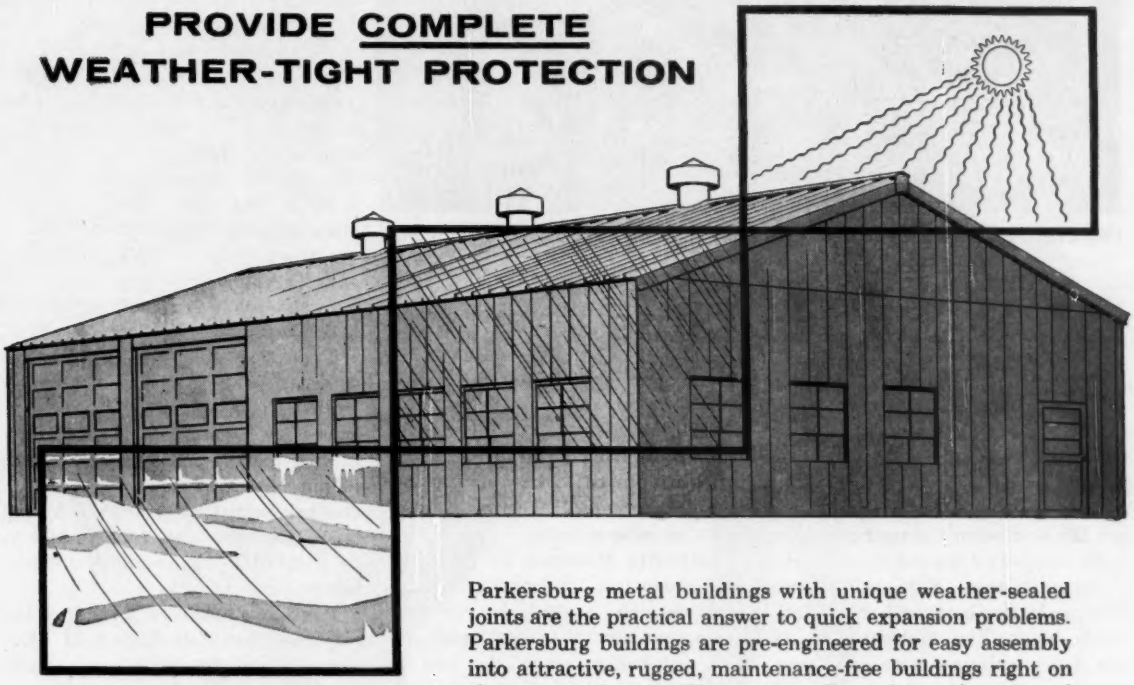
At this week's meeting of the New York Paint, Varnish & Lacquer Association, Heyden Newport Chemical Corp. (New York) disclosed a new partial addition technique for processing alkyd resins. The key: a stepwise esterification of fatty acids that increases the proportion of high-molecular-weight linear polymers.

The high-polymer alkyd process is adaptable to standard equipment for either fusion or solvent processes, says Heyden, is particularly well suited for the manufacture of long-oil alkyds from tall-oil fatty acids. Applied to conventional formulations, the technique is said to reduce phthalic anhydride losses, to produce resins characterized by higher viscosities, faster dry times, improved alkali and detergent resistance, color and color retention, flexibility and adhesion.

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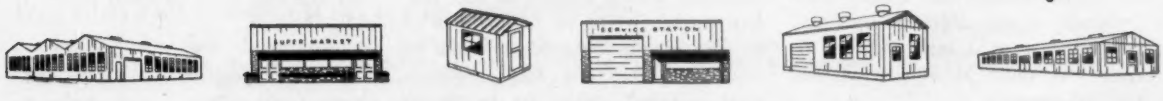
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FLEXIBLE FEEDER: Multiple fuel supply lines on kilns boosts lime output.

Triple Play in Lime

Leave a team of engineers alone long enough with a balky equipment problem and you're likely to wind up with more improvement than you bargained for. That's what happened recently at Union Carbide's Electromet Division when it turned engineers at the company's Metal Research Laboratories (Niagara Falls, N.Y.) loose on a production bottleneck in its Ashtabula plant. The problem: vertical lime kilns, suffering from poor heat distribution, severe "hanging" and serious refractory damage, were unable to keep up with the plant's lime consumption. Unexpected result: radical modification tripled design capacity of the kilns, virtually put Electromet in the lime business.

The problems at Ashtabula started in 1946, when Electromet replaced the rotary kilns employed in the production of lime for carbide and other smelting operations. Despite their higher cost and greater fuel consumption, rotary kilns had long been preferred by the industry for their freedom from operating difficulties. But when fumes from these units began to create problems in community relations, Electromet switched to vertical kilns that did not contribute to air pollution.

Equipment chosen for the job consisted of three 50-ft.-high shaft kilns, 11x11 ft. in internal cross-section. Designed to use induced draft and producer gas as a fuel, each of the kilns was rated at a 100-tons/day nominal capacity.

It didn't take the company long to realize that the fume-free vertical units were not adapted to burning the 3¼x2-in. limestone available at the plant. But solving the serious operating problems proved to be a formidable task that occupied Electromet engineers for several years.

Corrective Measures: To break the lime production bottleneck, the engineers decided, it would be necessary to improve control of heat input and fuel distribution across the kiln to facilitate fast vertical movement of the feed to counteract hanging. Tackling the fuel problem first, they increased the induced draft progressively from 6-in. to 28-in. (water gauge), thereby stepping up the specific production rate from 1 to 4 tons/day per square foot of kiln cross-section. To prevent stone from being sucked out of the kiln under the high draft, inverted tall narrow channels with suction at both ends were substituted for conventional gas off-take pipes.

Accurate fuel distribution was more difficult to achieve, required more extensive changes. Failure of refractory ducts necessitated the development of water-cooled steel ducts consisting of heavy H beams encased in a water-cooled box. Satisfactory distribution was provided by partitioning each beam in the middle to form four ducts (two from each end). Each duct was equipped with a number of fuel outlets through which air or mixtures of air and combustion products could be introduced into the kiln. Pipelines were installed inside the beams to discharge fuel at the desired rate into the center of each of the outlets. With this arrangement, the fuel supply to each part of the kiln can be adjusted at the complex header network (*see cut*), which feeds the water-cooled beams.

To facilitate control of maximum flame temperature with minimum detraction from heat evolution above 1000 C, beams were installed at two levels. At the first level, the initial stage of combustion now produces gas of low calorific value, which mixes into and burns in the second stage with the highly superheated air in the kiln. At the upper level, the third stage of combustion results in a hot gas of low calorific value, which burns with the hot residual oxygen contained in combustion products from the lower zones.

Controlled combustion in several stages, says Electromet, reduces localized high flame temperatures, causes fewer hangs. Added advantage of the system: end-supported beams permit sight-glass viewing of the "V" channel formed by downward-flowing lime. This allows the visible burden to be checked for temperature distribution and hangs.

Worth the Effort: As a result of the extensive modification, each of Electromet's vertical kilns is now capable of producing 480 tons/day of lime—more than the total design capacity of the original three-kiln installation. And though equipment redesign of this proportion is both costly and time-consuming, the end—in this case, at least—appears to have more than justified the means.

EQUIPMENT

Operations Recorder: A portable, drum-type operations recorder that shows at a glance the on-and-off time of process equipment over a 24-hour, 36-day cycle is now available from Gorrell & Gorrell (Haworth, N.J.). Each day, the recording stylus moves up ⅛ in.; next day's record appears on horizontal line directly above that of previous day. No ink is used; stylus turns transparent the opaque wax crystals on impregnated chart paper, thus allowing color of chart paper to show through.

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Radiant Heaters: Velotron, Inc. (New York) offers a new multifrequency infrared tube for low-cost,

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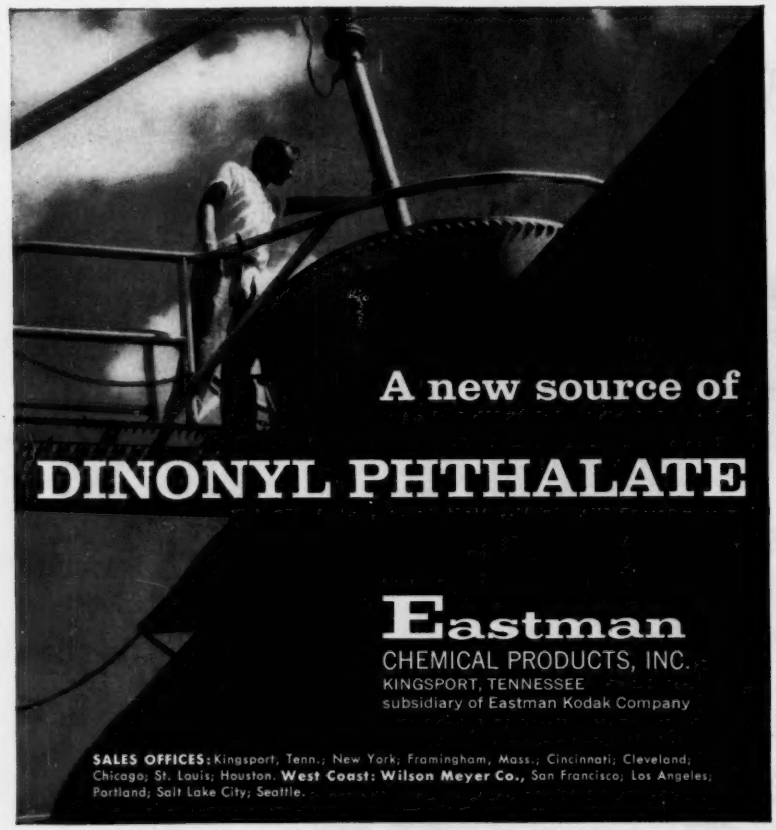
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Measurement System: Norwood Controls (Norwood, Mass.) is out with a new electromechanical signal generator system called ElectroSyn. Basic system can be used for measurement, indication, transmission and control of pressure, differential pressure, flow, liquid level, temperature. Extreme flexibility, low maintenance and reliability are cited as features. Analog-digital converter and other equipment can be added as needed.

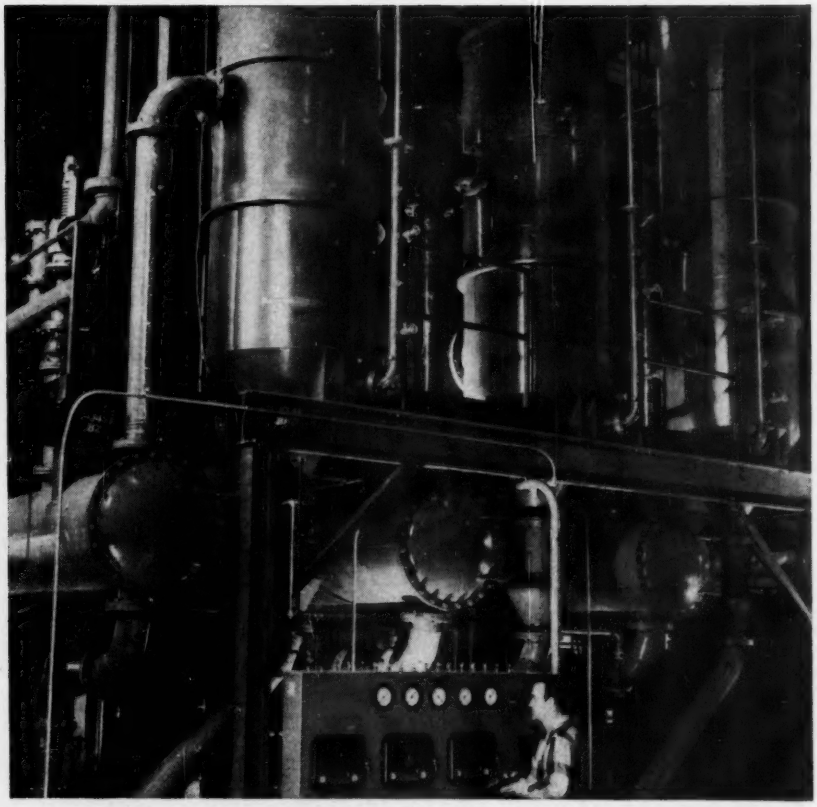
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Bulk-Handling Control: The Robac, a new electronic "memory circuit" control unit made by Hardy Scales Co. (Maywood, Calif.), permits remote-control handling of bulk materials with a fingertip dial selector. Unit operates with granulated, powdered and liquid bulk materials.



A-Power Pellets

Among nuclear products making their public debut at the Atomic Exposition in Philadelphia's Convention Hall this week are Norton Co.'s (Worcester, Mass.) ceramic fuel pellets. Made of normal and enriched uranium oxide, thorium oxide and mixed compositions, those pictured above were made for subcritical and critical experiments in Argonne National Laboratory's boiling-water reactor.



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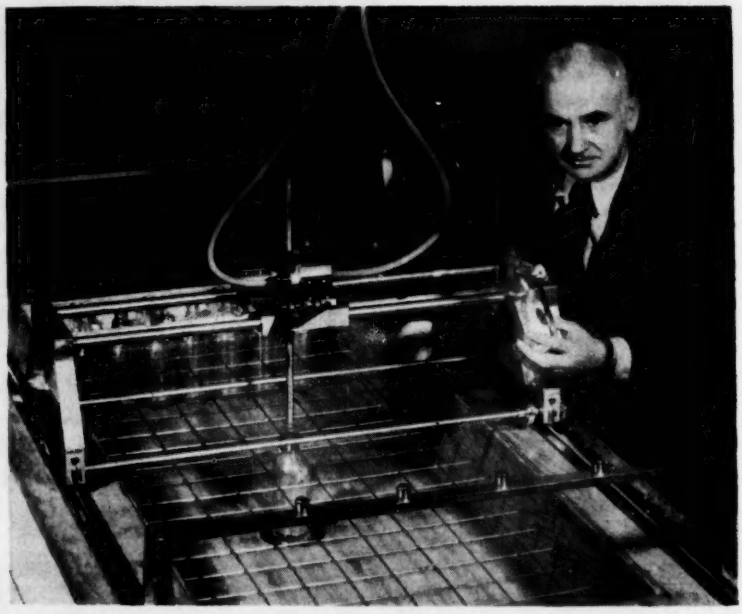
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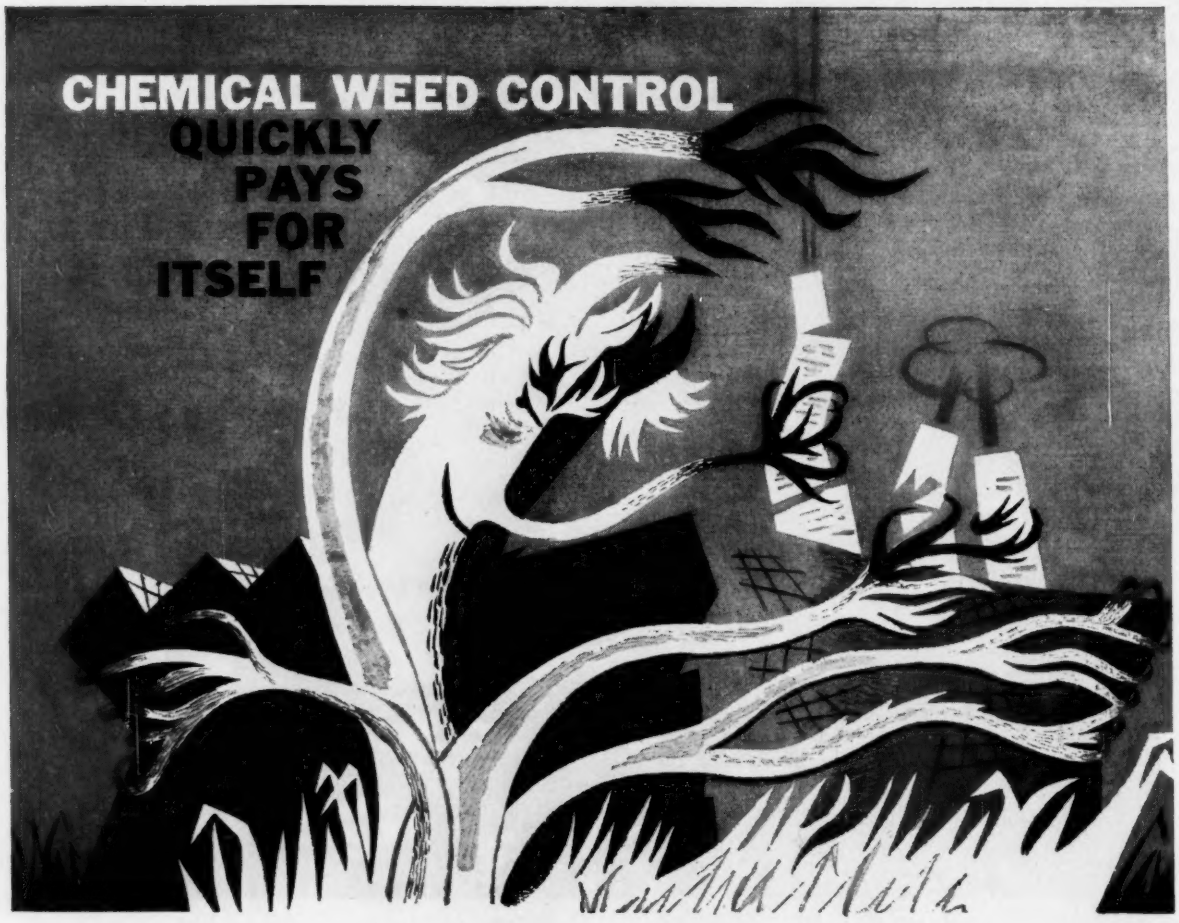
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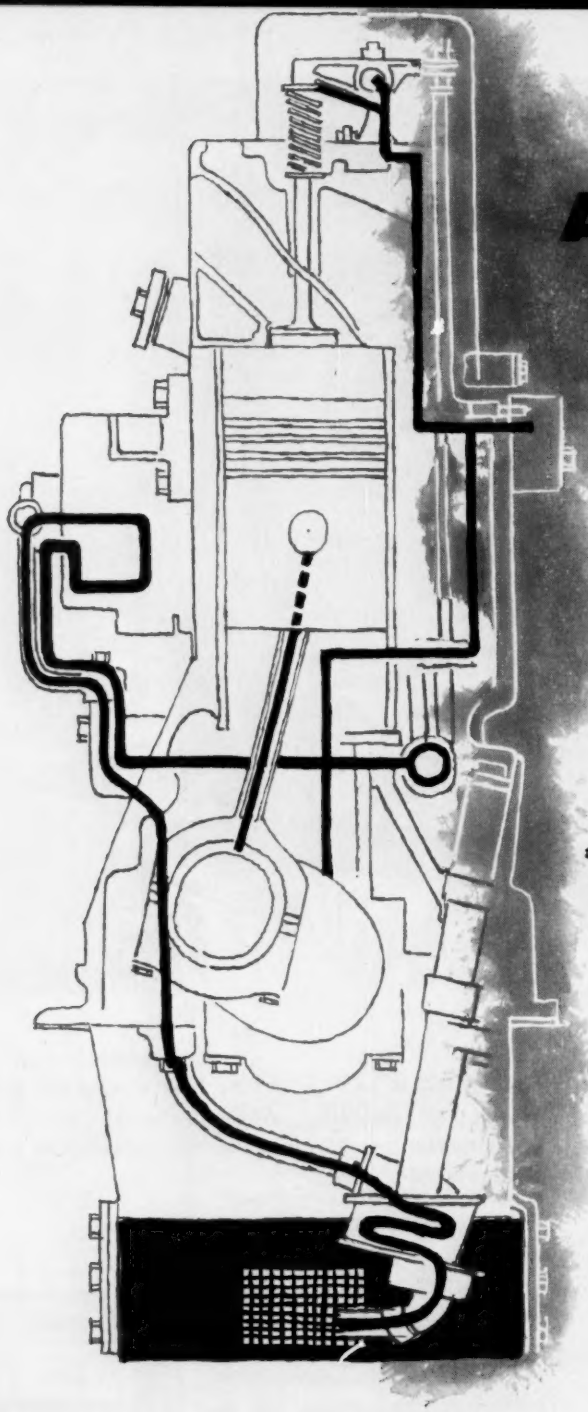
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Technology
Newsletter

CHEMICAL WEEK
March 16, 1957

The first, rational total synthesis of a natural penicillin has been worked up by MIT researchers.

"Rational" is a key word in that statement because actually Karl Folkers, of Merck, had previously developed a technique for producing synthetic penicillin. Vincent du Vigneaud of Cornell Medical carried it a step further, managed to produce and isolate a small amount of penicillin. MIT workers, Professor John Sheehan and Research Associate Kenneth Henery-Logan, have developed a method more amenable to large-scale production. Their synthesis—financed by Bristol Labs—is being reported this week in the *Journal of the ACS*.

"Natural" is also a key word in referring to the synthesis, because Sheehan and Dale Hoff earlier this year (*JACS, Jan. 5*) reported a synthesis of an artificial penicillin.

•

Penicillin synthesis has lost a lot of glow from the commercial standpoint. During the war, thousands of workers were hard at work trying to uncover a practical commercial synthetic route. But the fermentation process has come a long way. Penicillin G now sells for 6½¢/million units. Thus, any synthetic process would probably have to justify itself on other than economical grounds.

From the scientific standpoint, the synthesis at MIT stands as an accomplishment of some stature. Sheehan, in fact, describes one critical step as "putting an anvil on a house of cards."

What's more, the work is not without its commercial implications. Merck (which supplied some of the intermediates for the Sheehan-and-Henery-Logan synthesis) has developed 10 analogs of the product of the earlier Sheehan-Hoff synthesis. Merck is testing their efficacy.

The hope—from a commercial standpoint—is to discover a product that would have a wider range of effectiveness, be effective against organisms that are now resistant to penicillin or be one with less tendency to produce allergic reactions.

•

The fact that Stauffer has a metallic titanium process is now official. The disclosure in the firm's annual report, published last week, is described as the "first public announcement" of a process that the firm has been quietly working on (*CW Technology Newsletter, Nov. 10, '56*).

Moreover, the firm reports that the method may be applicable to making other metals—e.g., columbium, tantalum and zirconium.

Stauffer is not saying much about the process other than that it starts with titanium tetrachloride and proceeds through the subchlorides. That, incidentally, squares with the belief that it's a catalytic disproportionation (*CW Technology Newsletter, Feb. 2*).

National Bureau of Standards has succeeded in electrodepositing several of the refractory and light metals or their alloys from organic solutions. And it has polished the previous work it had done on electrodeposition of aluminum.

So far, NBS has not been able to electrodeposit straight titanium or zirconium from organic solutions. But it has done it with alloys of those elements with aluminum using complex metal compounds in ether. It has also deposited alloys of magnesium and has made coherent deposits containing 97% beryllium from an ether solution of beryllium halides and alkyls. In addition, it has deposited a brittle, coherent alloy of beryllium (70%) and boron (30%) from an ether solution of beryllium borohydride.

•

Freeport Sulphur will build that cobalt and nickel plant to utilize its huge deposits in Moa Bay, Cuba, now that it has received the green light from General Services Administration. The firm has been eager to get started on such a plant, and only last fall had indicated it was all ready (*CW Technology Newsletter, Nov. 3, '56*).

Freeport has successfully completed pilot-planting of the acid leach process it will use. This is how the project will operate: Freeport will mine ore in open pits, leach it with sulfuric acid and then ship it to a Gulf Coast plant, where it will separate and reduce nickel and cobalt. Rated annual capacity of the plant will be 50 million lbs. of nickel and 4.4 million lbs. of cobalt.

Under an agreement with GSA, Cuban American Nickel Co. (a Freeport subsidiary) will furnish, through June 30, '65, up to 271 million lbs. of nickel and 23,835,000 lbs. of cobalt at market prices. The government will have the right to require delivery of up to 30% of the nickel output each year.

•

Another nickel project in Cuba, National Lead's expansion of the government-owned nickel producing facility at Nicaro is just winding up. National Lead has completed 75% of the expansion. When 100% complete, the plant will have a capacity of 50 million lbs. of nickel yearly. Incidentally, the expansion was planned as a $43-million project. National Lead now estimates it will complete the task for only $37 million.

•

Lederle is introducing a new antibacterial sulfonamide (sulfamethoxypyridazine) that's said to provide high, prolonged blood levels with only one-fourth the normal sulfa drug dosage. Called Kynex, it has been under investigation for two years.

Recommended dosage is 1 gm./day (2 tablets), in contrast with the 4-gm. (8 tablets) dose normal for sulfas. And a single 2-gm. dose, Lederle says, is enough to maintain blood levels for 72 hours. With comparable sulfas, a dose like that would be good for only 6 hours.

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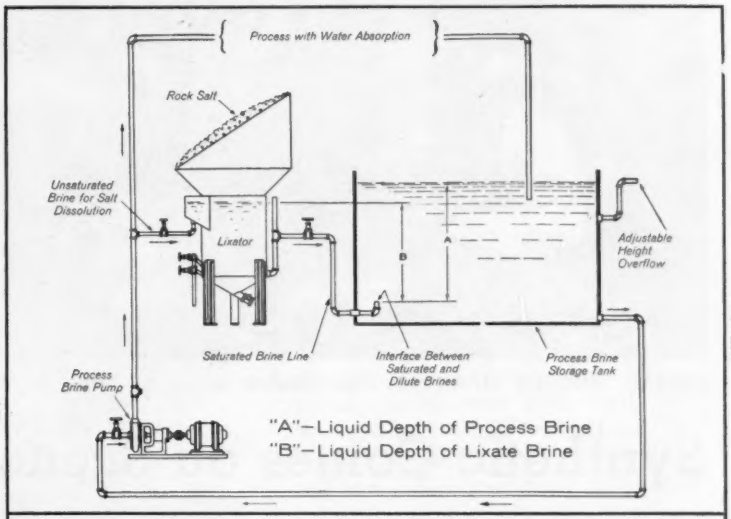
Principle of "Lixate Hydraulic Balance." The principle under which this system operates involves the hydraulic balance between the column of saturated fortifying brine and the column of process brine.

For example: you have a column of 70° S. process brine with a liquid depth of 10 ft. You have another column of 100%-saturated Lixate Brine 9.46 ft. in depth. These two columns are in hydraulic balance. In other words, even though they are connected by a small pipe near the bottom of the columns, there will be no flow from the Lixator brine supply into the process brine. The 70° S. brine will not change in strength. (The formula for determining the relative heights of the two brine columns is available from International.)

"Lixate Hydraulic Balance" at work. Suppose the process brine falls below 70° S. Even though the process column is still 10 ft. high, its specific gravity is lower. Hence, some of the 100%-saturated brine (of heavier specific gravity) will flow through the connecting pipe into the process brine.

The flow will continue until the process brine is restrengthened to its original 70° S., at which point the two columns will again be in hydraulic balance, and all flow from the stronger brine to the weaker will stop. Since this operation takes place *whenever* the process brine is weakened, the result is a process brine which varies so little from its original salometer reading as to be virtually constant in strength.

*Trademark. U.S. Patent 2,508,170, and Patents Pending.



TYPICAL "LIXATE HYDRAULIC BALANCE" SYSTEM. Fully saturated Lixate Brine from Lixator (at left) maintains original strength of dilute brine in tank.

"Lixate Hydraulic Balance" is foolproof, because of the basic behavior of two brines in contact with each other. It is known that the rate of diffusion between a strong and a weak brine is surprisingly slow, even over a large contact area. However, to reduce this diffusion to a negligible amount, the interface (area of contact between the brines) is purposely kept small. In many cases, a perforated shield is placed around the diffusion zone to further protect the interface. With this shield, the Lixate Brine and the process brine can be thoroughly mixed by agitation without causing excessive diffusion at the interface.

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INDIAN RUBBER HARVEST: Consternation among producers as . . .

Synthetic Comes on Scene

India's next five-year plan includes the construction of a synthetic rubber plant—an item that's creating considerable consternation among Indian and other Asian producers of natural rubber.*

Annual output of Indian natural rubber, they aver, will increase from the present 24,500 tons/year to some 40,000 tons by 1960 and to 65,000 tons by '70—a growth rate considered sufficient to meet India's expanding rubber requirements.

But Indian government spokesmen disagree, point to the fact that during the past few years, the country's domestic rubber production has not kept up with demand. Too, the country's rubber consumers have had to rely increasingly on imports to fill the gap.

For example, in 1956 India produced 24,481 long tons of natural rubber, while total domestic consumption increased to more than 31,000 tons; about 2,400 tons consisted of synthetic rubber (a sizable percent increase over the 106 tons of synthetic used in '55, and the scant 1 ton used in '50).

Two-Way Stretch: The government's program to step up rubber production isn't limited to the building of a synthetic rubber plant. It also includes replanting of 70,000 acres of existing rubber plantations and the setting apart of another 50,000 acres for new planting. But neither do these plans please everyone in the Indian rubber industry.

Objections stem from the government's policy of restraining, in part, expansion by large-scale entrepreneurs and encouraging the small holders. These small holders will achieve their production targets with the help of state-partnered cooperative farming societies, which will process their latex, market the product, and distribute chemical fertilizers.

The price of encouraging the small cultivators, some observers foresee, will likely be paid by Indian rubber manufacturers—mainly tire manufacturers such as U. S.'s Firestone Tire & Rubber Co., and the U.K.-based Dunlop Rubber Co.

The Plantation Enquiry Commission, which, at New Delhi's request, has been investigating Indian rubber cultivation, has advised that a "surcharge of 2% ad valorem" be levied on prevailing excise duties on rubber manufacturers in order to subsidize the new planting program assigned to small cultivators.

Consequently, Indian tire manufacturers (who last year were compelled by the Indian government to reduce their prices by about 11%) are looking anxiously to New Delhi in the hope that they will be allowed to pass on to the consumer what they consider a "new burdensome impost."

(Tire production in India amounted to 917,000 units in 1955, the last year for which accurate output figures are now available. This compares with a total output of 8,010,000 units that year in all of Asia and Oceania. Japan and Australia are by far the biggest tire-producing countries in this area.)

Equal Shares: Of the 120,000 acres to be replanted or set apart for new plantings, 50% is to be reserved for small growers—23,364 of whom own two-acre holdings. The commission has recommended that, in the Indian context, the size of an economic holding must be at least four acres.

Total area under rubber cultivation in India is 207,239 acres; of this, a little more than 100,000 acres are comprised of estates of more than 100 acres. Non-Indian companies (mainly British) own rubber plantations covering about 40,000 acres. Total non-Indian capital invested in rubber plantations is about $5 million, or 24% of the capital investment in plantations exceeding 100 acres.

Although the British-based companies are better managed than their Indian counterparts, the British have been selling out a large part of these interests during the last 15 years. (The gradual exodus of the British from the Asian rubber business isn't limited to plantations in India. Last fall, for example, British-owned rubber estates in Malaya, totaling some 13,000 acres,

*India is a relatively small producer of natural rubber when compared with other Asian countries; total area under cultivation in India in '55 was 207,240 acres. Acreage under cultivation in other Asian countries, according to latest available figures: Indonesia, 4.76 million acres; Malaya, 3.53 million; Thailand, 839,600; Ceylon, 660,985; Vietnam and Cambodia, 332,234; Sarawak, 245,421 acres. Total acreage in Asia, 10.85 million; in the world, 11.54 million.

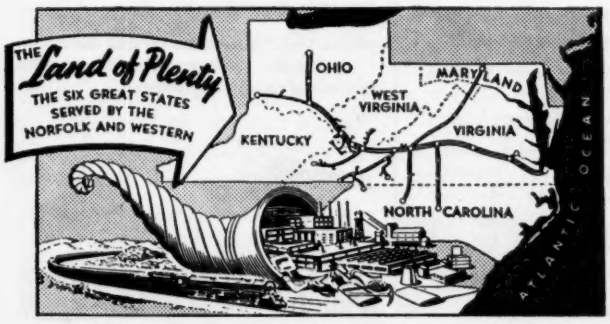


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were sold. Four estates went to Chinese buyers, three to an Indian group).

The trend toward selling out apparently is based partly on the continuing uncertainties of political currents in Asia and partly on fears that natural rubber, over the long term, may become a loser in world markets as competition by cheaper synthetics increases. Hence, the British are stepping out despite their ability to make a greater net profit on net worth of investment than do Indian-owned companies. British dividends, in relation to their paid-up capital, run as high as 24.76%, whereas the percentage for Indian concerns is in the 13-20% range.

Synthetic Threat: The Indian government's announcement early last year that it contemplates building a synthetic rubber plant touched off a heated controversy. Rubber consumers naturally welcomed the prospect of less reliance on rubber imports to bolster domestically produced supplies. On the other hand, growers of natural rubber saw in the proposed synthetic rubber plant what to them is a real threat of disastrous competition. Production of natural rubber, they argued, would increase enough to meet all Indian needs. Producers of natural rubber in India and in other Asian areas also raise the specter of widespread unemployment; thousands would be thrown out of work, they insist, if competitive pressure by synthetic rubber were allowed to bring about abandonment of rubber plantations.

A synthetic rubber plant, it's pointed out, is built on only a few hundred acres of land, employs less than 1,400 workers to turn out 180 million lbs./year of rubber. But to produce the same amount of natural rubber requires the cultivation of 180,000 acres of land and an army of some 55,000 workers, including tree tappers and other estate employees. Furthermore, a synthetic rubber plant can get into operation within a year, and can make profits in the second year of operation; but a rubber plantation will not provide a good return until the eighth year after planting.

The alarm of Asia's rubber growers over the pending encroachment of synthetic rubber is further emphasized by their concern about synthetic production in other areas of the world. Last year, for example, Malayan rubber traders vehemently protested the building of synthetic rubber facilities in Great Britain, saying that such action "militates seriously against Malaya's interests."

It's a virtual certainty, too, that any future proposals to build other synthetic rubber plants in India will be met with increased opposition from producers of natural rubber. Synthetic rubber may yet carve an important niche for itself in Asia's rubber industry, but it will not do so without a struggle.

These energetic protests notwithstanding, the Indian government apparently is not convinced of the alleged danger to rubber growers, or the ability of natural rubber production to catch up with demand within a reasonable period of time. The government is now scrutinizing a project report submitted by "a foreign firm," the name of which still remains a "secret."

India will definitely get a 20,000-tons/year GR-S rubber plant; it will be located at Uttar Pradesh, the country's major alcohol-producing area, because GR-S manufacture in India is dependent on butadiene made from alcohol rather than refinery gases.

Indian synthetic rubber manufacture will require an estimated 15,000 tons/year of butadiene and 5,000 tons/year of styrene. An $11-million butadiene plant will be set up in the Bareilly district of Uttar Pradesh; and, according to latest reports, a styrene plant with an initial capacity of 9,000 tons/year, will be located in Rourkela (Orissa). Ethylene gas, required for styrene production, is most economically produced from coke-oven gases at a place where hydrogen is separated for the manufacture of ammonia. Rourkela is such a place, since a steel plant being constructed there (with German aid) will include facilities for fertilizer manufacture.

Primary reason for locating the GR-S synthetic rubber plant in Uttar Pradesh near the butadiene plant is that styrene can be transported more easily than butadiene.

It's clear that Indian producers of natural rubber will have to live with the upstart synthetic rubber industry; but it will be an enforced toleration on home grounds, of a generally fast-growing business that already threatens the natural product in many world rubber markets.



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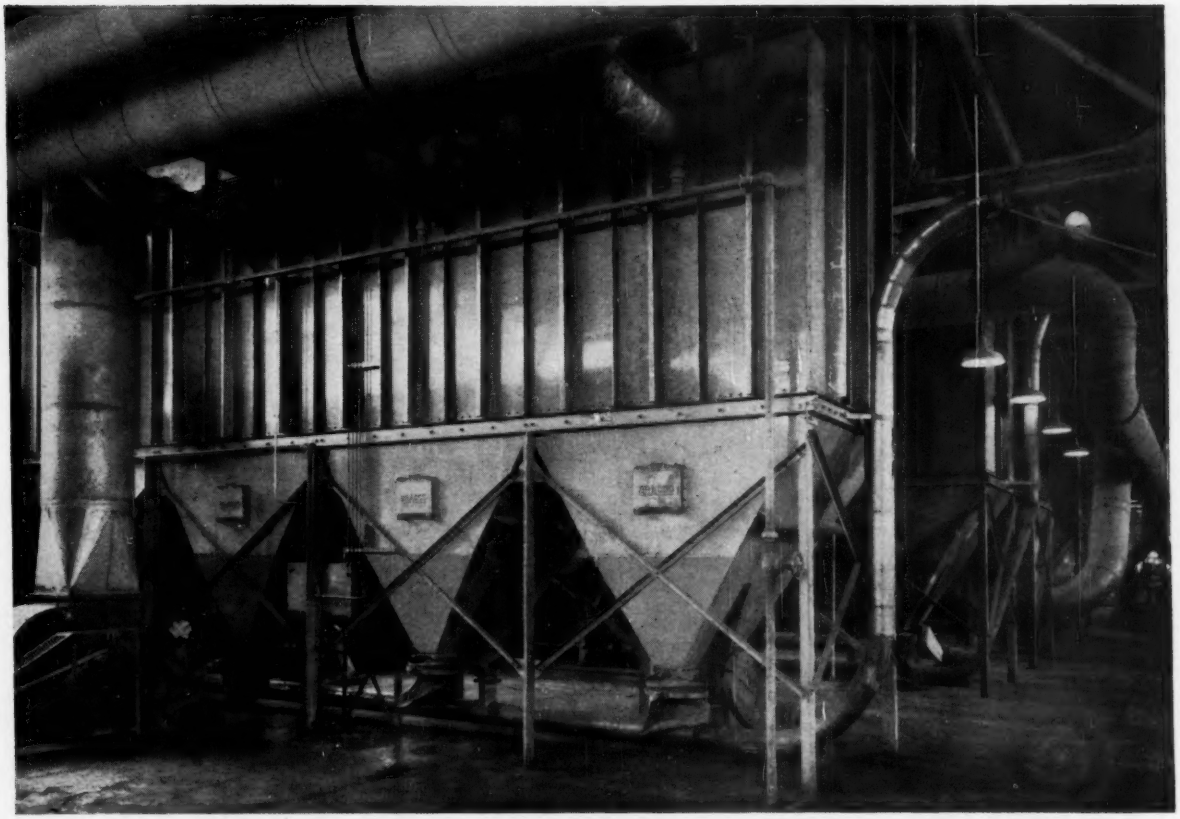
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Group	Sales (thousand pounds)	Percent Change from '55
Total sales	**3,975,439**	**+ 8.4**
Total soaps	**1,285,112**	**— 4.8**
Total syndets	**2,690,327**	**+16.1**
Solid soaps and syndets	3,681,894	+ 6.0
Liquid soaps and syndets	293,544	+52.1
Solid soaps	1,251,224	— 4.5
Solid syndets	2,430,671	+12.3
Liquid soaps	33,888	—15.2
Liquid syndets	259,656	+69.7
Toilet bars	506,156	+ 2.4
Laundry, white	168,020	— 0.8
Laundry, yellow	55,791	— 3.6
Chips, packaged	60,003	—10.1
Chips, bulk	105,962	+ 6.8
Granulated, packaged	194,529	—22.1
Granulated, bulk	90,847	— 2.4
Washing powder, packaged	3,833	—26.1
Washing powder, bulk	15,706	—19.5
Hand pastes and powders	14,679	— 1.4
Pastes and jellies	14,997	—11.8
Shaving soap	3,581	— 3.9
Shaving cream	15,476	— 8.9
Miscellaneous	1,644	—45.6
Soap shampoos	1,312	—62.5
Detergent shampoos	23,564	—14.1
Detergent shampoos, solid	15,276	—16.9
Detergent shampoos, liquid	8,288	— 8.3
Syndets to total market	67.7%	+ 4.5%

Syndets Widen Their Lead

U.S. consumption of soaps and synthetic detergents in '56 moved close to the 4-billion-lbs. mark, according to a just-released annual sales census of 75 manufacturers who account for a high percentage of the total output.

Conducted by the Assn. of American Soap and Glycerine Producers, the survey reveals that the nation's total sales of soaps and synthetic detergents last year climbed to more than 3.97 billion lbs., or 8.4% more than in '55; dollar sales for the year amounted to $913,532,000—up 6.1% from '55.

Total sales of synthetic detergents —both solid and liquid—now represent 67.7% of the market; a new high of more than 2.69 billion lbs.—16% more than in '55—was sold last year. Dollar sales climbed 10.4%, to $597,441,000.

Consumption of liquid detergents again skyrocketed. Sales of 259,656,000 lbs. in '56 was 69.7% greater than in the preceding year, the dollar value of $102,969,000 was up 41.9%.

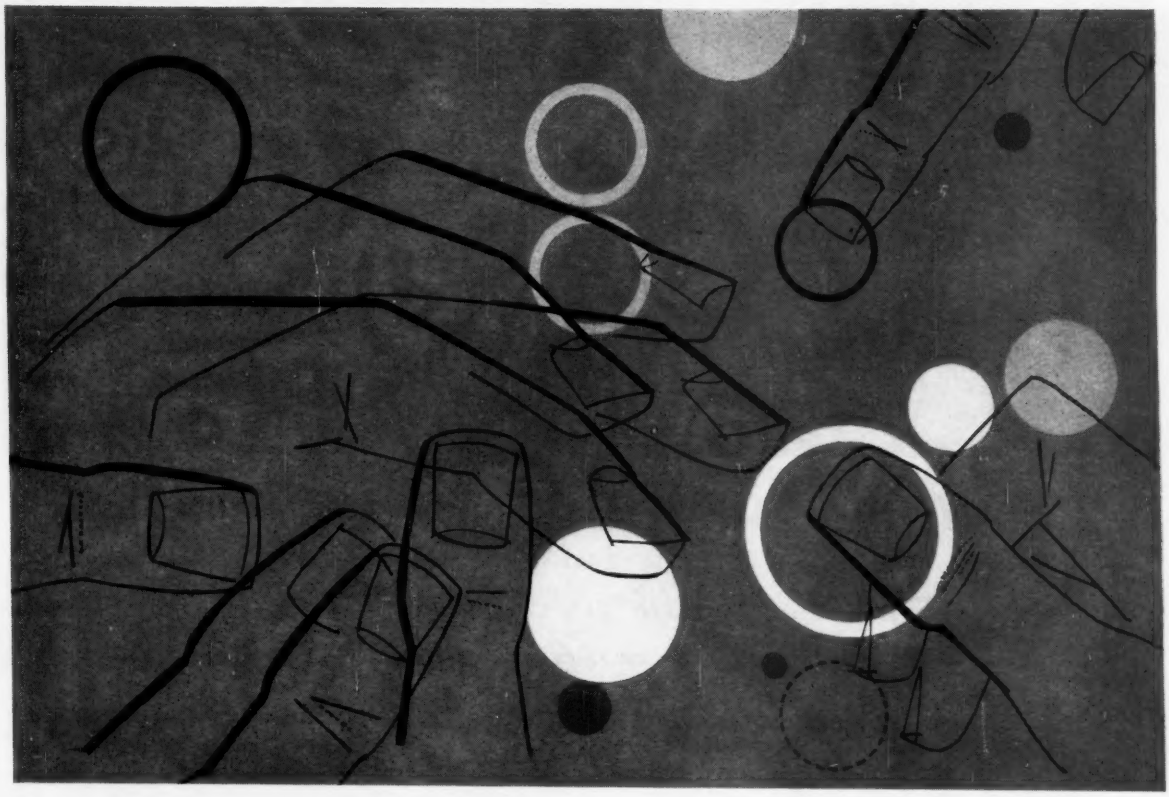
Soap sales, however, slipped off again to a little less than 1.28 billion lbs., or 4.8% less than in '55; dollar sales also dropped about 1.2% to $316,091,000.

An end-use breakdown of soap and syndet applications (*see table*) reveals many more declines than gains in '56 sales; and soaps consistently lost out to syndets.

For example, the sale of solid soaps in '56 dropped 4.5% lower than in '55, while solid syndets jumped 12.3%. Similarly, liquid soaps were off 15.2%, while liquid syndets gained 69.7%.

And while sales of both soap and synthetic detergent shampoos declined, the former dropped 62.5%, the latter a relatively small 14.1%.

The '56 figures again raise the question: How long will competition by syndets continue to squeeze out soaps? And again, there is no clear-cut answer.



When 110 men press these buttons they put a new packing concept to work

110 INSTALLATIONS PROVE NEW ECONOMIES OF FLUOPACKER FILLING MACHINE

"FLUIDIZING" is a revolutionary new principle for packing powdery and granular materials in multiwall bags. It goes into operation when you push the start button of the Fluopacker Filling Machine. A small amount of low pressure air is introduced into the supply bin through a canvas air pad. The "fluidized" material then flows into the bag through the filling tube because of a difference in "pressure head" between the bin and the bag. All the operator has to do is place the bag on the filling tube. It's a quick, simple, clean and efficient operation that brings you four important benefits:

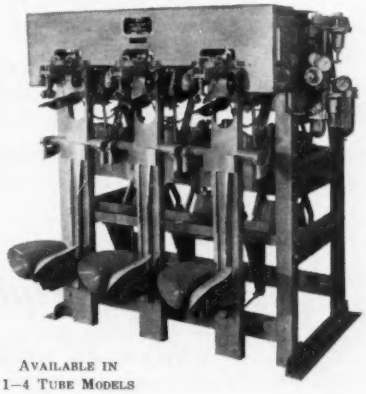
CLEANER BAGS: Dust leakage during filling is eliminated with the use of an expandable rubber seal between the valve of the bag and the filling tube.

IMPROVED WEIGHTS: The "fluidized" material flows smoothly and uniformly into the bags. The scale beam moves slowly and steadily, gives greater weight control.

BAG SAVINGS: "Fluidizing" causes less aeration than conventional packing methods, and results in a more dense product. Often this means bag sizes can be made smaller; result—lower bag cost.

LESS MAINTENANCE: The Fluopacker Filling Machine has simple pneumatic controls. There are few moving parts and no rotating parts. It's explosion-proof, too.

Learn how this versatile machine can fit *your* packaging needs. Call the nearest St. Regis office, or write to St. Regis Paper Company, Dept. CW-316, 150 East 42nd Street, New York 17, New York.



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FROM INSECTICIDES TO PERFUMES

MHI SODIUM HYDRIDE IN OIL
PROVIDES DEFINITE PRODUCTION ADVANTAGES

For condensation, alkylation, transesterification and carbethoxylation steps, MHI sodium hydride oil dispersion makes obsolete many of the ordinary reagents such as methylate, sodamide and sodium metal. Its basicity lies between $NaOCH_3$ and $NaNH_2$, yet it condenses many esters $NaOCH_3$ cannot accomplish effectively and does so in less reaction time, at lower temperatures and with higher yields.

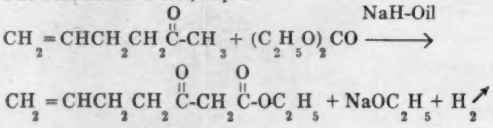
A 25% or 50% dispersion of NaH in Bayol 85, an industrial white oil, can be handled with complete safety without hydrolysis in air. It can be pumped, metered or screw fed. Will not form an alcohol as a by-product as does methylate—therefore, no forcing techniques are necessary.

MHI sodium hydride-oil dispersion compares price-wise with sodamide and sodium methylate, yet, unlike sodamide, NaH will not attack ester groups and form amides. It will not cause reductive condensation as does sodium metal and it is easier to handle than either sodium metal or sodamide.

Here Are A Few Profitable Applications

ALLETHRIN *(insecticide)*:

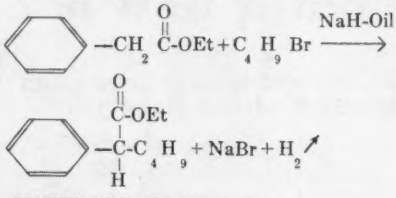
An intermediate step in the Allethrin synthesis can be performed by NAH-oil in a condensation reaction. Allyl acetone and diethylcarbonate when reacted with NaH-oil form the product ethyl-3-oxo-6-heptenoate. The reaction is clean, rapid.



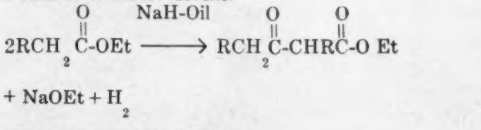
The evolved H_2, if accurately measured, provides a means of following the extent of reaction.

ALKYLATION OF ESTERS WITH ALKYL HALIDES AND NaH-Oil:

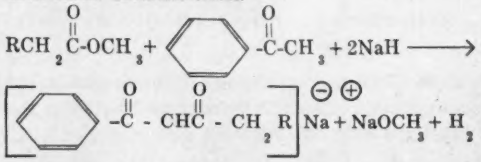
This can be accomplished by running the reaction at low temperatures in THF or a more polar solvent such as "diglyme"–dimethyl ether of diethylene glycol. The alkyl halide should be present at the start of the reaction. The technique cannot be used with Na metal.



CONDENSATION OF ESTERS:



KETO-ESTER CONDENSATION:



Complete technical information is available upon request.

CHEMICAL HYDRIDES DIVISION

Metal Hydrides Incorporated

PIONEERS IN HYDROGEN COMPOUNDS

CONGRESS STREET, BEVERLY, MASSACHUSETTS

Market Newsletter

CHEMICAL WEEK
March 16, 1957

Are chemical process industries heading for a slowdown? There may be some concern about the immediate future (*CW, Feb. 16, p. 21*), but experts say the long-range outlook is unquestionably bright.

Look at pharmaceuticals, for example. By '65, drug industry sales may approach $4 billion/year, compared with the estimated '56 total of $2.1 billion. That statement set the tenor of the talk delivered last week by Chas. Pfizer's administrative vice-president, Allan Greene, at the annual gathering of the American Institute of Chemical Engineers in White Sulphur Springs, W. Va.

Greene envisions "no leveling-off period for drugs and biochemicals in prospect for the immediate future," and also noted that "while competition is increasing, new products are keeping the industry as a whole moving forward."

There's a hop, skip and a leap in synthetic fibers' future, too. Before the same group in White Sulphur Springs, Frank Soday, vice-president and director of Chemstrand's Research and Development Division, and president of the Southern Assn. of Science and Industry, spelled out the fiber prediction: annual use of synthetics will increase to 1.1 billion lbs. by '65, and to 4 billion lbs./year in '75.

Current consumption of man-made fibers (not including cellulosics such as rayon) is just under 500 million lbs./year. This, Soday pointed out, represents a 50-fold increase over synthetic fiber consumption just 15 years ago when nylon was introduced to the textile market.

•

Competitive rayon price cuts—posted reluctantly by producers this past week—again spotlight the effects imports can have on U.S. price levels. Competition from foreign rayon textile staple, which has been selling at from 29¢ to 29½¢/lb., has caused price cuts to be posted for domestic material. Courtaulds cut its regular rayon textile staple prices by 2¢/lb., to 29¢/lb.; later, American Viscose and Hartford Rayon announced changes.

American Viscose also reduced its carpet staple from 35¢ down to 33¢/lb., while Hartford set a similar schedule for its Viscalon 66, white, crimped, carpet-rayon staple. (Courtaulds doesn't produce such a carpet item). Hartford says it will not reduce prices of its regular textile rayon staple or its Viscalon 44.

Explained Hartford's sales manager, George McGrath: "The price reductions are not justified by raw material or manufacturing costs, and are occurring in a period when the trend is toward higher prices for man-made fibers."

"Relatively stable" is the word for most chlorinated solvents markets. On perchloroethylene and trichloroethylene, for instance, supplies are generally ample to cover all requirements. Despite the favorable supply/demand balance, though, consumers will be paying more for their needs the first of April.

At least one major producer has announced April 1 increases that will nudge solvent prices up ¾¢/lb. Slated for hikes, in addition to "perc" and trichloro: carbon tetrachloride, methyl chloride, methylene chloride. Reason for the advances: "Higher labor, raw material, container, and handling costs."

Resins for surface-coating uses will cost more next month. Also because of "higher manufacturing and shipping costs," Monsanto will raise bulk prices on melamine surface-coating resins by ½¢/lb. east of the Rockies; 1¢/lb. on urea coating resins east of the Rockies, and ½¢/lb. on Western deliveries. Effective date: April 1.

Before the end of the week, chances are that other producers will also go along with the increases.

Trade talk proved out last week when one major maker announced April 1 increases on some carbon blacks. The price jumps, however, won't be as high as anticipated (*CW Market Newsletter, Feb. 29*). Price of some grades of carbon black used in the rubber industry will go up ½¢/lb.

All cellophane makers are now quoting higher prices. Du Pont, following earlier announced increases by Olin Mathieson and American Viscose, last week posted a 3¢/lb. hike, which brings the price of its most widely used types to 62¢/lb.

All three producers cite increased costs as reason for the new changes, but—adds Du Pont—technological advances have made it possible "to hold the rise in cellophane prices to 53% over the low of 1939, while raw material costs have risen 123% and wage rates have risen 182% in the same period."

SELECTED PRICE CHANGES, Week Ending March 11, 1957

	Change	New Price
UP		
Phenothiazine, NF, fib. dms., c.l., frt. alld.	$0.04	$0.43
Sulfur, refd. flowers, N.F., bgs., mines, spot, cwt.	0.50	4.75
Tin metal (Straits)	0.01	0.99625
DOWN		
Aniline oil, tks., frt. alld.	$0.01	$0.20
Lithium hydroxide, monohydrate, dms., dlvd.	0.02	0.78
Platinum metal, oz.	6.00	95.00

All prices per pound unless quantity is stated.



On the Pt-Co color scale Allied Methanol rates 5 maximum — a degree of sparkling clarity unequaled by your drinking water. In pharmaceutical and other fine chemical applications this freedom from color is one measure of the purity of Allied Methanol. Maximum non-volatile residue of 0.001% is another.

Allied Methanol is shipped in barges, tank cars and tank trucks from the South Point, Ohio plant and from strategically located stocks in principal cities. Nitrogen Division's technical service staff is always at your call.

Dept. M2-7-1

Allied Chemical

NITROGEN DIVISION

40 Rector Street, New York 6, N. Y.

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate—85 • Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Sodium Nitrate • Methanol • Nitrogen Solutions • Nitrogen Tetroxide • Fertilizers & Feed Supplements

"Coordineered" for

ALLIS-CHALMERS

HEAVY PROCESSING EQUIPMENT



Allis-Chalmers builds many types and sizes in a given equipment line. As a result, recommendations are completely unbiased . . . influenced only by your particular requirements.

Grinding Mills — The Allis-Chalmers broad mill line includes rod mills for coarse wet or dry grinding, ball mills for 20 to 200 mesh wet or dry grinding, *Ballpeb* and *Compeb* mills for fine grinds, multi-compartment type for stage grinding.

Crushers — In most Allis-Chalmers gyratory crushers, precise size adjustment, compensation for wear, emergency unloading are all accomplished by the flick of a switch. Four types of jaw crushers, a series of roll crushers and hammer mill are also built by A-C.

Vibrating Screens — Allis-Chalmers makes vibrating screens for scalping, medium and fine separation, wet or dry screening, rinsing and dewatering.

ALLIS-

Unit Operation

Designed to Work Together for Increased Production, Better Products and Greater Profits

AS MANUFACTURERS of the most diversified, most complete line of processing *and* electrical equipment, Allis-Chalmers maintains separate departments staffed by specialists for each product. Coordineering results from an interdepartment exchange of ideas and the correlation of specific knowledge and skills . . . *an integration of thinking, planning and engineering.*

Invaluable Help for Your Staff or Consultants

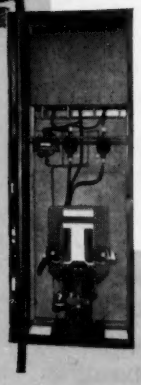
It all starts with an examination of your present processing operation . . . an expert evaluation that dictates the equipment recommendation. New as well as existing equipment is teamed up in a right-for-the-job application.

Research, too, is a part of coordineering. The Allis-Chalmers laboratory is one of the best equipped, best staffed in all industry. Information gained in laboratory and pilot plant testing helps determine the equipment and process best suited to a given application.

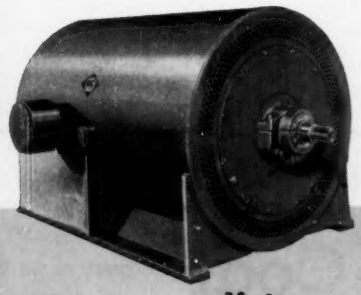
Coordineering embraces many things . . . experience, skill, service, undivided responsibility. And they all add up to the greatest possible operating efficiency for you.

Ballpeb and Compeb are Allis-Chalmers trademarks.

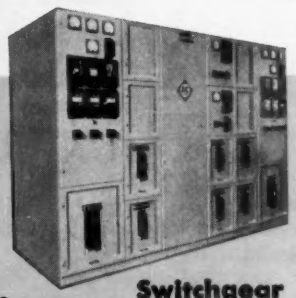
LIVE BETTER ELECTRICALLY



Control



Motors



Switchgear

POWER PACKAGE . . . for Your Processing Unit

Allis-Chalmers Builds the Following "Coordineered" Equipment:

HEAVY	1	Crushers Grinding Mills Screens
PLANT	2	Compacting Mills Roller Mills Screens
PYRO-PROCESSING	3	Furnaces Kilns Coolers Dryers
POWER	4	Generators Condensers Pumps Transformers Switchgear Substations Motors V-belt Drive Control
LIQUID HANDLING	5	A complete line of Centrifugal Pumps
AIR & GAS HANDLING	6	Centrifugal Blowers Axial Compressors Rotary Compressors

Allis-Chalmers also makes equipment for solvent extraction, electronic heating, metal detection and inter-floor conveying.

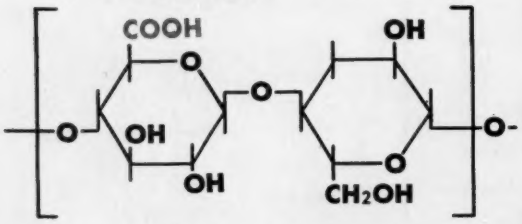
Bulletin 25C6177 covers all Allis-Chalmers equipment for the process industries. Bulletins on specific equipment lines are also available. See your Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

CHALMERS

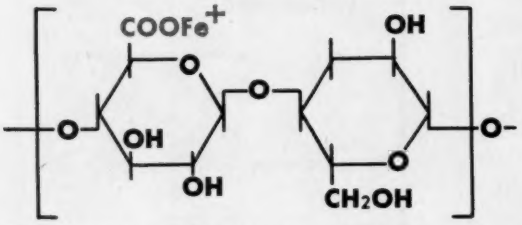
A-C ALLIS-CHALMERS

A-5338

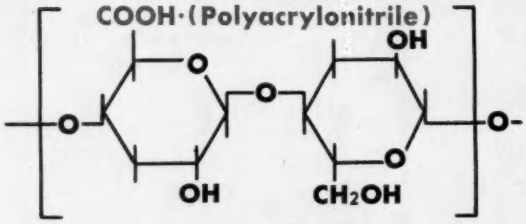
Acrylonitrile and iron . . . . . Make a stronger cotton



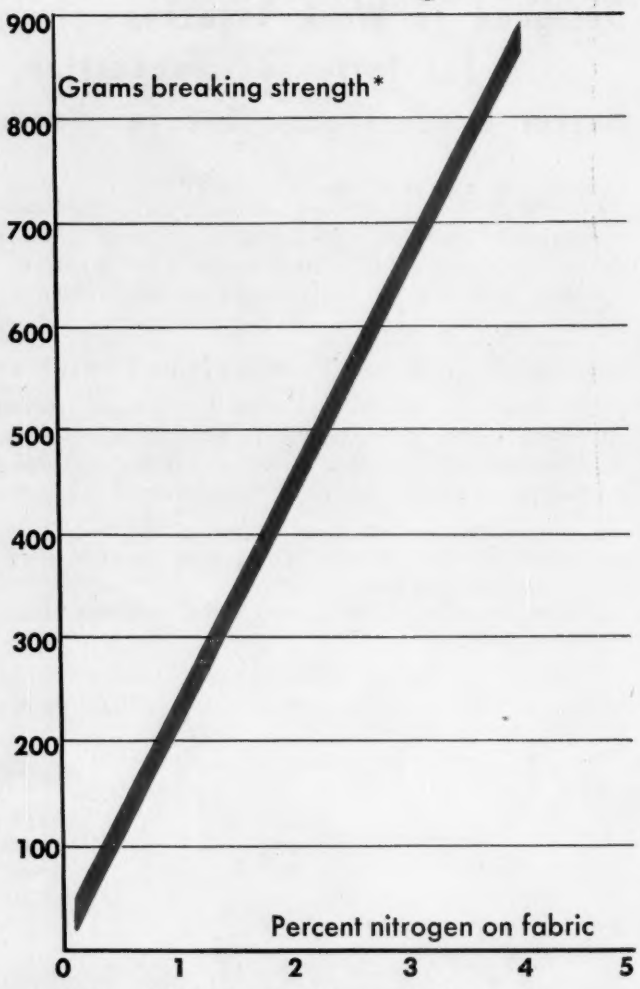
Cotton's carboxyl groups are the key to the reaction. They serve as anchor points for . . .



Ferrous ions which attach to the carboxyls, convert the cotton into 6-ferrous cellulose. Hydrogen peroxide oxidizes ferrous ion . .



Causing the acrylonitrile present to polymerize, deposit preferentially at the carboxyl-group site.



* Of warp yarn in fabric after 42 days soil burial.

Cotton Gets a Tough Coat

In its quest for commercial acceptance in cotton processing, cyanoethylation* may find competition from a new acrylonitrile rotproofing treatment (*CW Technology Newsletter, Feb.* 16). Unlike cyanoethylation—which chemically modifies the cotton cellulose by reaction of the latter with acrylonitrile—the new process deposits polyacrylonitrile on and probably within the fiber. The technique, moreover, does not require expensive special equipment (estimated cost of a cyanoethylation plant is $300,000), can be carried out in a conventional sealed dyeing machine.

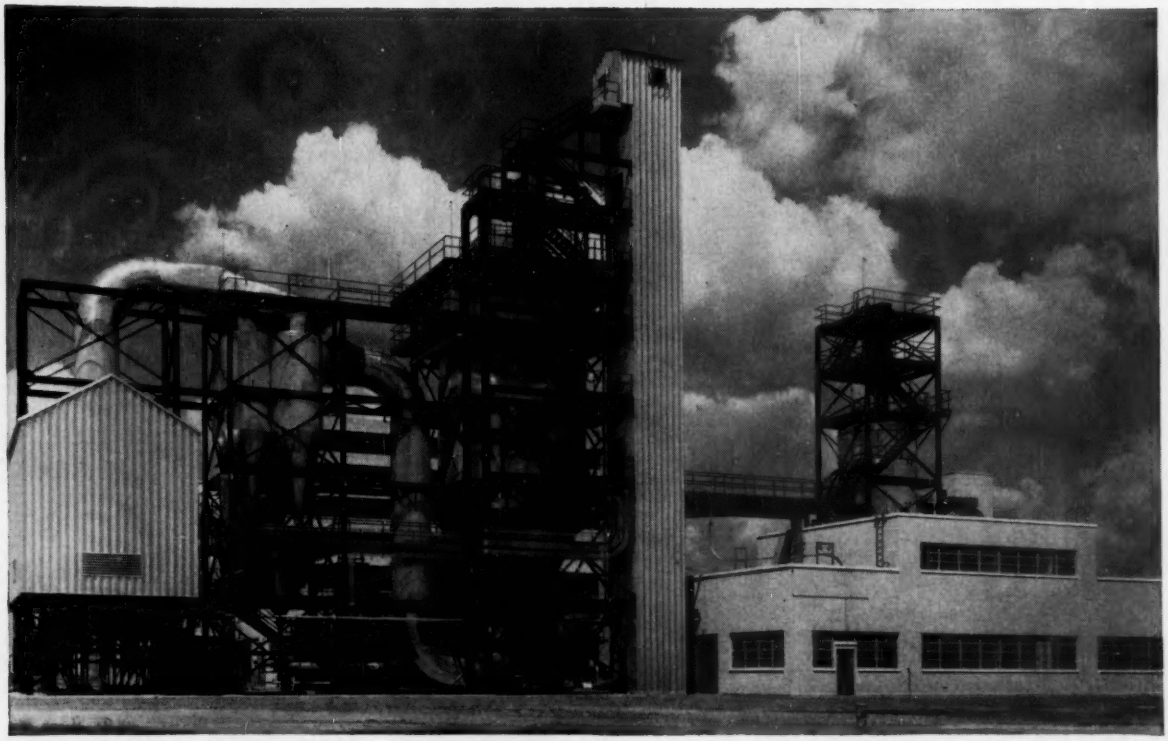
The new process stems from research by film-maker, Tee-Pak Inc. (Chicago). Its application to textile materials was worked out—under Tee-Pak's sponsorship—by Textile Research Institute (Princeton, N. J.) group leader Irvin Gottlieb and his assistant, Edward Jeffries.

Gottlieb and Jeffries plan to process 120,000 sq. yds. of tobacco shade cloth, enough to cover 20 acres. The fabric, to be used at Cullman Bros. tobacco farms in Hartford, Conn., will be periodically tested for degradation. If this test gives satisfactory results, the next trial will involve treatment of 5 million yds.

In its trials with cloth, TRI is using acrylonitrile supplied by American Cyanamid. Cyanamid also supplied the acrylonitrile for earlier tests on cotton, yarn, fabric and thread (mostly at the School of Textiles, North Carolina State College, Raleigh, N. C.).

Cyanamid's cyanoethylation pilot plant at the Rossville, Ga., mill of cotton processor Standard-Coosa-That-

*For the latest on cyanoethylation see CW, June 23, '56, p. 41.



Corn Products' plant for spray-drying of Snow-Flake Instant Dried Starch, showing (left to right) filter, cyclones, spray-drier, elevator tower, and building for heating, preparation and packaging. All facilities are of stainless steel for sanitary protection.

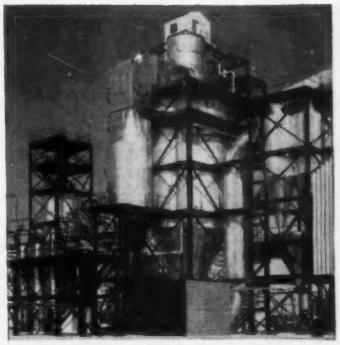
Blaw-Knox completes second plant for Corn Products Refining Company

—new plant is first to use spray drying in the instant starch field

Applying the most modern food engineering techniques, Blaw-Knox designed and erected a new instant starch processing plant for Corn Products Refining Company at Corpus Christi, Texas. Spray drying is used to produce an improved product. The plant includes a starch precooking system, sanitary piping for transfer of precooked starch, and separate packaging facilities.

This plant represents but one of the process areas in which Blaw-Knox has long experience. Other fields include chemicals, resins and plastics, petroleum and petrochemicals, fertilizers, fats and oils, chlorine and alkali production, nuclear energy, synthetic fuels, and waste recovery.

We welcome the opportunity to explore your problems with you.



View from rear of plant shows giant spray drier in center, which rises to 88 feet above ground and is 24 feet in diameter with the cyclone separators at right.

BLAW-KNOX

BLAW-KNOX COMPANY

Chemical Plants Division

Pittsburgh 22, Pennsylvania/Chicago 1, Illinois

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TRI'S JEFFRIES, GOTTLIEB: For cotton fabrics, an acrylonitrile shield.

cher Co. hasn't been in operation since last summer. Monsanto, likewise, has discontinued its cyanoethylation project at Texas City, Tex. Monsanto's studies, carried out in cooperation with the Institute of Textile Technology (Charlottesville, Va.) and others, combined with Cyanamid's findings, resulted in a report last September containing discouraging cost figures.

Acrylic Armor: The new process and cyanoethylation both require about the same amount of acrylonitrile to adequately rotproof cotton. Both strive to anchor about 4% nitrogen (by weight) to the fiber. But they do this by entirely different means.

In cyanoethylation, the acrylonitrile reacts with hydrogen of the cotton's hydroxyl groups. This is accomplished by a continuous process involving treatment with caustic, acrylonitrile, and acetic acid, in that order, and washing and drying.

Gottlieb believes that the acrylonitrile polymerization is initiated at the carboxyl groups in the cotton. The acrylonitrile, however, does not react with the cotton. Ferric ions are thought to catalyze the polymerization.

Here's how the process is carried out: Cotton cloth, wound on beam in the dye machine is wet out, using a detergent, then washed. About 8 lbs. of ferrous ammonium sulfate per 50 gal. of water is then added, yielding 0.025% ferrous ion by solution weight. Ferrous ions replace hydrogens on the cotton's carboxyl groups.

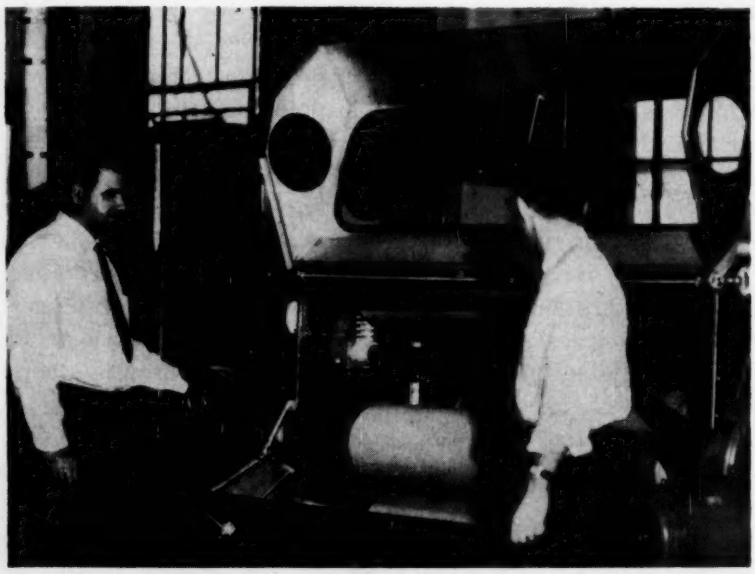
The cloth is then washed to remove all ferrous ions except those bound to the fiber. Acrylonitrile (20 lbs./100 lbs. of cloth) and water are added, the machine is sealed and brought to reflux conditions. Four lbs. of 33% hydrogen peroxide/100 lbs. of cloth are introduced into the system to convert ferrous ions into ferric.

The machine stands at reflux for 10 minutes, is then flushed. Cloth is washed, rinsed, frame-dried to the desired width. To improve light-resistance the cloth may be treated with a lead salt (e.g., lead nitrate and potassium dichromate prior to drying. This gives a 2% "add on" of lead chromate.

Cost Limit: Gottlieb's total material costs are about 6.5¢/lb. of cloth. Adding processing costs, total cost of treating tobacco shade cloth comes to about 4¢/sq. yd. That's about the limit tobacco farmers will pay for the rotproofing advantage.

But textile mills will also have to pay for the privilege of applying the treatment. Tee-Pak plans to grant nonexclusive licenses for a running royalty of 1% of the net selling price of treated fabric, subject to certain annual minimums.

The firm contemplates licensing the process not only under its patents but also under a trademark, still to be determined. To provide added incentive, Tee-Pak is prepared to grant the first licensee a one-year exclusive with



DYEING MACHINE: For application, no special equipment.



Boxcar has only 5′ door, sand piled level, floor rough, yet . . .

Michigan Tractor Shovel unloads entire 60 tons in less than 100 trips

"This was about the toughest boxcar unloading job a tractor shovel could get!" describes this Midwestern foundry's plant engineer.

"The car had a narrow 5-foot Canadian-type single door. Its floor was fairly rough. Its load of 60 tons of silica sand was piled almost level. Frankly, we didn't think our Michigan could unload it, but decided to give it a try."

200 ft cycles in 1 minute

"First thing we noted," says the operator, "was that Michigan's greater bucket capacity, power and instant shift more than made up for whatever slight maneuverability advantage smaller tractor shovels are supposed to have. Turning past the narrow door slowed the Michigan a bit, but I was always able to get in and out of the car without trouble. Loads averaged 10 to 15 cubic feet of sand each. Cycles of 200 feet between unloading point and boxcar took only a minute or two."

Unloads regular cars under 80 trips

Entire job took only 97 trips. Time compared favorably to unloading 50 to 60 tons of sand from a car with 6-foot door. "We receive 15 to 20 of these per week," says the engineer; "Michigan rarely needs more than 75 to 80 trips to unload any of them." Other Michigan assignments include cleaning the foundry floor . . . moving new sand from hoppers to shakeout bin . . . supplying the gray iron moulders.

Expect longer life

"We first noticed this 15 cubic foot Model 12B at a trade show," reveals another company official. "Here we got convincing proof of the longer machine life its planetary axles and torque converter would provide. We also felt its higher lift would make it easier to do some of our loading and unloading."

And less trouble

"Lower repair time was another expected gain," says the general foreman. "We've had Clark fork lifts and industrial trucks for years; they outlast all others by far. When we saw the same ruggedness built into Clark's Michigan Tractor Shovel, we bought it."

See it in action

Study a Michigan first-hand to see how these advantages can pay off *in your plant*. We'll be glad to let your operators run a demonstrator . . . glad to help you measure output on the type of jobs you want to see done. Call your nearest Michigan distributor to arrange details. For his name and address, send a postcard to:

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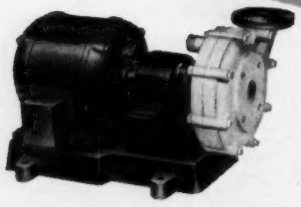
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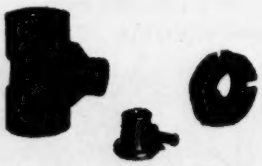
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RESEARCH

respect to treatment of certain fabrics.

Twenty percent of the royalties will be earmarked for further research and development of the process and for promoting the trademark.

Where the Business Is: Military demand for rot-resistant cotton extends to webbing, thread, tent fabrics, tarpaulins, etc. Besides tobacco cloth, potential civilian applications include awnings, filter cloth, etc. This business is now taken by firms that use rot-proofing methods such as acetylation and treatment with copper naphthenate and copper 8-hydroxy quinolinolate.

So far, the new process has been successfully tried on a range of fabrics. It doesn't seriously affect the fiber's physical properties, doesn't catalyze degradation of the fiber.

A lot more data—including economic evaluations—is needed to provide a firm basis for an estimate of the new process's future. It's still too soon to determine whether the method will give acrylonitrile its hard-sought market in cotton treating.

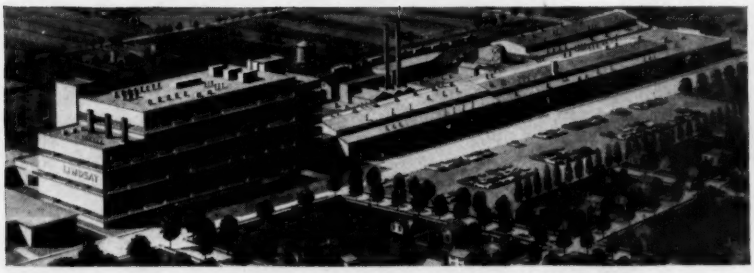
EXPANSION

- Celanese Corp. of America has opened its new fiber development laboratories in Charlotte, N.C.
- Thompson Products, Inc. (Cleveland), has started building a research center that will include chemical and metallurgical laboratories. Plans call for completion of the center within five years, at an estimated cost of more than $5 million.
- A $200,000 addition to American Potash & Chemical Corp.'s Whittier, Calif., research laboratory, opened recently, doubles previous workroom space at the site. Ampot has tripled its research budget and investment in research facilities in recent years, is pushing studies on such materials as lithium carbonate, lithium hydroxide, boric oxide, elemental boron, borate esters, phosphoroborine compounds, parathion, electrochemicals.
- Shell Development Co. (Emeryville, Calif.) has opened new laboratory facilities to be used for synthetic rubber research.
- Partners in the newly established Cellulose Research Institute at Syracuse (N.Y.) University's College of Forestry include American Viscose Corp., Buckeye Cellulose Corp., Celanese Corp., and Hercules Powder Co.

Want a Carload of Rare Earths?

They're available for prompt shipment in a gram to a carload

a report by LINDSAY



Back in the early 20's, it would never have occurred to us that in a few years we would be shipping rare earth salts in carload quantities for a surprising variety of chemical and industrial applications.

For a long time, as you may know, the rare earths were simply a by-product of our regular business of producing thorium nitrate for gas mantles. Up to 35 years ago, rare earths were little more than scientific curiosities. Industry had not yet discovered them as a practical scientific tool.

But, as time sped by, we learned more about these unusual elements and how to produce them in larger quantities, in higher purities and at lower cost. And with their increasing availability, industry began to find ways to use them profitably in their operations. In the last ten years, we've seen a sharply increasing rise in the demand for rare earths from a rather amazing variety of industries.

WHY THIS DEMAND? Well, as we see it, it's due largely to the enormous technological strides made since World War II. Industry itself sparked much of this interest by its own explorations of the rare earth group in a search for materials to improve products and processes. Their studies in relation to specific problems often uncovered totally unsuspected applications. It was a sort of chain reaction that is still increasing in velocity.

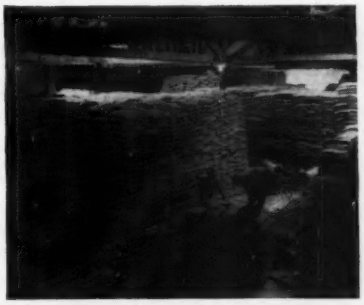
LINDSAY BUILT NEW PLANT. We saw what an industrial revolution the rare earths were creating. And anticipating heavy demands, we constructed our modern plant in 1953. The Lindsay plant facilities, including more recently developed and improved separation processes (such as our ion exchange systems), increased our production capacity manyfold.

WHAT ARE THE RARE EARTHS? Rare earths are *not* rare—nor are they earths. This group of 15 elements (atomic numbers 57 through 71) are trivalent metals found together with thorium and yttrium primarily in monazite ore. In chemical properties they are almost identical, a fact which makes them difficult to separate and at the same time makes them valuable tools for research and industry.

HOW THEY ARE USED. The fascinating description of industrial applications of the rare earths would fill many books. We work with these materials every day and we're constantly amazed at the variety of ways in which they're used. Here are only a few. Glass polishing. Steel additives. Catalysts. Colorizer and decolorizer for glass. Medications. Ultra-violet light absorber. Arc carbon electrode cores. Aluminum and magnesium alloys. Lighter flints. Radiation-proof glass. Waterproofing. Textile production. Color TV tubes . . . and the list goes on and on.

RARE EARTH SALTS. Lindsay produces rare earth salts in large tonnages and in varying purities. Most of them are surprisingly low in cost. Rare earth chloride—for example—a mixture of several of these elements—is only about 25¢ a pound and available in virtually unlimited quantities. High purity separated rare earths are, of course, more expensive, but economical in relation to the wonders they perform.

HUGE SOURCE OF SUPPLY. To keep up with the demand and assure industries of a steady supply, we maintain in our plant a stockpile of monazite that is now 24,000,000 pounds. And we're constantly prospecting in various parts of the world for this miracle ore—source of the versatile rare earths.



WORTH INVESTIGATING. Your research people may find it rewarding and profitable to study the possibilities of the application of rare earths to your own products and processes. We will be happy to supply pertinent data and to make available to you the help of Lindsay's technical staff.

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SINCLAIR RESEARCH TEAM*: For motorists' engines, a 'secret' additive to combat combustion deposit buildup.

X-Chemical—the Secret's Out Now

'A factory worker asks: What is X-Chemical?

Answer: X-Chemical is a new and entirely different type of chemical added to gasoline. As a matter of fact, a new plant had to be built to manufacture X-Chemical, which was not available before. Because X-Chemical is a new discovery, its composition is secret.'

The Sinclair Dealer (Sept. 1956)

This week, the secret is out in full view: X-Chemical is tri-n-butyl phosphine made for Sinclair by Food Machinery and Chemical Corp.

When Sinclair brought out the new additive, it made clear that the composition was going to be a deep, dark secret. But right from the start, it began to assume some shades of gray. Here's how the story unfolded:

(1) Sinclair's description of the compound led to the conclusion that it contained phosphorus (*CW, Sept. 15, '56, p. 78*).

(2) Further information clearly indicated it to be a phosphine (*CW, Sept. 29, p. 61*).

(3) Word leaked out that Food Machinery's Fairfield Division was the manufacturer and that the compound was probably an alkyl phosphine (*CW, Oct. 27, p. 119*).

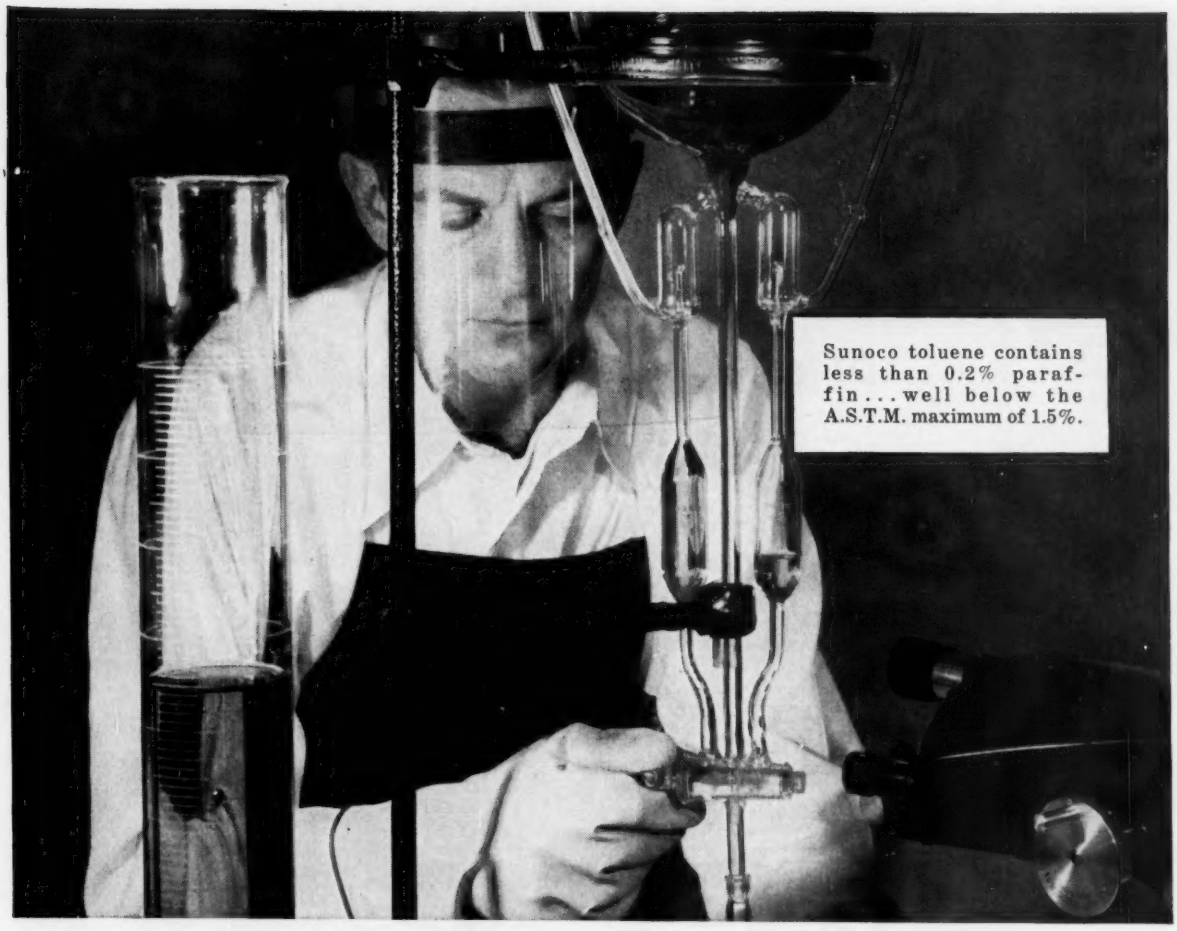
(4) An Australian patent application was thought to be significant. It covered the use of a trialkyl phosphine in a gasoline containing tetraethyl lead (*CW, Feb. 2, p. 65*).

(5) Sinclair revealed that X-Chemical is tri-n-butyl phosphine (*CW, March 9, p. 91*).

(6) Sinclair has also received a Belgian patent (548,250).

Broader Coverage: But although Sinclair is sticking to the butyl compound right now, it is applying for patent coverage on a range of trialkyl phosphines (identified as having the general empirical formula R_3P, in which R is an alkyl that need not be the same at all three positions in the molecule.) It includes those in the groups from methyl (CH_3) to amyl (C_5H_{11}). The preferred ones are those in which at least two of the alkyl groups are in the range from C_2 to C_4 inclusive, but excluding the tertiary C_4 isomer. The third alkyl group is in the range C_1 to C_5. Thus, the preferred phosphine group includes: compounds having the same alkyl group at three positions; and, in addition, such compounds as diethyl methyl phosphine, diethyl propyl phosphine, diethyl isopropyl phos-

* Sinclair's X-Chemical research team (clockwise): Richard Payne, project engineer, engine laboratory; Kenneth Smith, director light-oil division research; Cecil Francisco, technical director of Harvey, Ill., laboratories; R. Donald Pinkerton, research associate; Adolph Mrstik, project engineer, fuel research.



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phine, diethyl butyl phosphines, and diethyl amyl phosphines.

Secret Action: Just how the additive works is still unknown. But Sinclair researchers feel there's enough evidence in hand to hypothesize that the composition of deposits produced by fuel containing tri-n-butyl phosphine is chemically different from those produced by other gasolines. Apparently, says Sinclair, there's a different complexing action of the compounds with the tetra-ethyl lead, the hydrocarbons and the products of combustion.

Because of this action, Sinclair claims, its compound overcomes the problem of deposits in modern high-compression-ratio engines, which today causes the majority of customer complaints. The major factor affecting loss of new-car power and performance is the buildup of solid deposits in the combustion chamber. Three big problems resulting from this common cause, together with their adverse effects: (1) increase in octane requirement—causing detonation, loss of power and engine damage; (2) preignition—causing loss of power and engine damage, reducing fuel economy; (3) spark plug fouling—causing loss of power and reduction in fuel economy.

Sinclair maintains that the new chemical shows results previously unobtainable in reducing preignition and spark plug fouling. More important, the new chemical is said to actually eliminate the harmful deposit buildup found with the other additives tested. Other advantages claimed for the trialkyl phosphines: their specific gravity and boiling points are very similar to those of gasoline. When additive and gasoline are mixed, a more compatible blend is said to result.

The chemical is recommended for use in quantities of 0.2-1.0 cc./gal. of gasoline. About 0.5 cc. of tri-n-butyl phosphine per gallon of gasoline is now included in commercial blends.

Counterside: Not everyone agrees with Sinclair, of course. Shell, for example, which stole the thunder in the gasoline additive field with TCP (tricresyl phosphate), maintains that its additive has an edge and that it has test results to prove it.

Even in phosphines, Sinclair doesn't stand all alone. Socony Mobil Oil Co. owns a patent (U.S. 2,368,866) on use of trialkyl phosphines in diesel fuels. But because of differences in claims, Sinclair sees no conflict.

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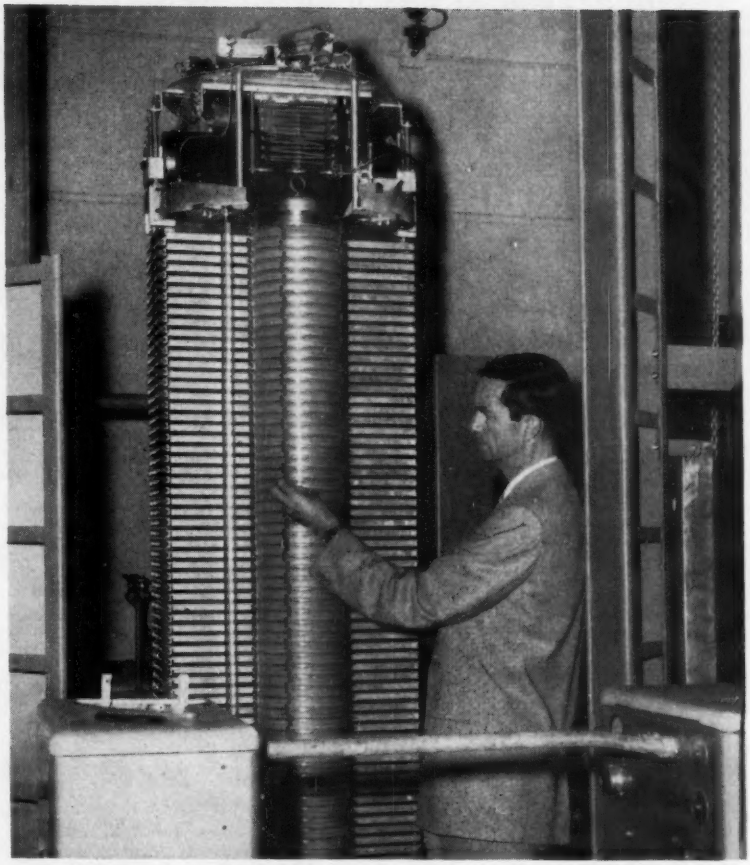
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HIGH VOLTAGE'S ROBINSON: In radiation, the largest center.

Big Gun in Radiation

The big (3 mev., 3 kw.) Van de Graaff accelerator shown above, being built by High Voltage Engineering Corp. for an undisclosed* "production" use by Du Pont, is only one of several new projects under way at High Voltage's new nuclear center at Burlington, Mass. The plant, with its new production, testing, and research facilities, was thrown open to the press last week. Believed to be the largest center of its kind now in full-scale operation, High Voltage's complex contains enough radiation test vaults to allow simultaneous operation of 16 accelerators. Each vault has 4-ft.-thick walls, is closed when in use by a 20-ton concrete block door mounted on trucks that ride on specially built-in rails.

One of the vaults contains a company-owned Van de Graaff for use by industrial firms in pilot studies of electron sterilization, polymerization, etc.

The new facility is unusual in another sense, too. It was paid for in cash (about $2 million) out of the young (founded in 1946) firm's capital. According to High Voltage's president and treasurer, Denis Robinson, the sizable outlay was possible largely because of a backlog of orders and a system whereby customers pay for the machines in increments as the machines are being built.

High Voltage also lays claim to having recently made and built the first microwave linear accelerator for commercial use (in sterilization applications). A 5-mev. machine, it harnesses a traveling wave of radio frequency to accelerate electrons.

* One Du Pont researcher, when asked what the firm was irradiating, replied: "The state of Delaware."

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